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THE RADIUM TREATMENT OF CARCINOMA UTERI*

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(From the Clinic of the Woman's Hospital)

THE grave menace of carcinoma looms largely at the present time in the public mind, because of the publicity given to the intensive research work carried out all over the world in an endeavor to combat this terrible scourge. We are all looking forward with hope that this plague, which so ruthlessly attacks all classes and nearly all ages, shall at last be conquered, as have some of the other death-dealing diseases, by a remedy practical in application and certain in reaching the deep-seated manifestations of this disease. Until that Utopian remedy is obtained, it is our duty to use to the utmost those means which long years of study and experience have shown to be the best available at the present time: namely, surgery and irradiation.

Statistics show that in the United States there are probably 300,000 people suffering from cancer at the present time. Cancer must be regarded as the most frequent independent cause of death in adult life; the death rate is increasing each year, and at present stands at the high figure of 89.4 per 100,000. The cancer occurred in the female genital organs, exclusive of the breast, in 14.14 per cent of these cases.

Whether the microbic origin of cancer is proved or not, or whether it be a "specific growth process," as believed by Blair Bell, there will be a long period of waiting before demonstrable proof can be had of the value of antimicrobic inoculations or intravenous metallic therapy. Radical surgery for carcinoma has probably reached the limits of per-

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fection, and we know with a fair degree of accuracy, from many years of observation, what percentage of apparent cures we may hope for in the cases that have sought relief early. The full value of irradiation, whether by radium or roentgen rays is still an open question, except that it is generally agreed that in advanced cancer of the cervix, radium is by far the most valuable palliative measure at our disposal at the present time. It behooves us then diligently to continue the study of end-results in cancer cases in order that we may contribute little by little to our knowledge of the most efficient methods of applying these remedies, and we should be encouraged to do this because a study of the available statistics of various clinics shows that there has been a steady improvement in the results obtained as a better understanding of irradiation has been developed.

CLASSIFICATION

One of the first essentials to a better understanding of end-results is the adoption by all clinics of a uniform system of classification of cervical carcinoma, of which simplicity is a necessary feature. Schmitz's classification seems to us to recommend itself on this ground, and we have adopted it in our clinic with slight modification in the interest of clarity as follows:

Primary Cases, those receiving initial treatment from us, are divided into four classes. In Classes I and II the disease is macroscopically limited to the cervix; in Class III the disease has extended beyond the cervix either in the broad or uterosacral ligaments or vagina, including the borderline cases; in Class IV are the advanced cases with extensive involvement of the tissues of the pelvis or abdomen, the so-called "frozen" pelvis.

Secondary Cases are those recurring after hysterectomy for cancer of the cervix.

We have preferred the term "secondary" to "recurrent," believing it would be less confusing to confine the term "recurrent" to any renewed activity of the malignancy, whether after operation or radium therapy.

Unless we have some uniform system of classification, a comparative study of results in the various clinics must always be difficult and inaccurate. As a result of this lack of uniformity any comparative figures we may have today are largely speculative. Again we should agree on what we mean when we speak of a "cure." In many of the reports the term "absolute cure" is used and is based on the generally accepted five year limit. Personally we believe that the "five year cure" is only a relative term, and we take it that when the term "free from symptoms" is employed it is meant subjectively, as objectively we cannot say in many of these cases that the infiltration or thickening that may still be palpable in the pelvis in symptomatically cured patients does not contain cancer cells capable of extending the disease. Fur-

thermore, we know of patients who have long passed the five year mark free from symptoms and apparently cured, who have subsequently died of cancer.

FOLLOW-UP

We believe a follow-up that is conducted by the surgeon himself is of far greater accuracy and therefore of more value in drawing conclusions than is the follow-up by letter from either the patient herself or from her family physician. Undoubtedly, the most perfect follow-up for carcinoma cases is that conducted in Sweden, as these patients are under government control, the government paying the necessary transportation expenses, etc. Heyman, of Stockholm, was able to report at the American College of Surgeons in 1924 a 100 per cent follow-up of cases. We realize that this is a very difficult problem in our large cities with their shifting population, yet we believe that a great improvement can be made in spite of the handicaps, if serious intensive efforts commensurate with its importance are brought to bear upon this phase of the subject. This is to be accomplished by proper organization and more funds for the Social Service Department.

We have found that the fact that the patient realizes that she will be seen and examined personally by the surgeon who operated upon her and who therefore, from her viewpoint, has a personal interest in following the progress of her case, will insure a high percentage of returns. One difficulty results from the patient's not realizing the serious nature of her disease, and when she has no subjective symptoms there is danger of her neglecting to continue to report to the follow-up. It is not our custom to tell these women that they have cancer if we can avoid it, but it is important that their next of kin should be promptly and fully informed of the character of the disease, the probable outcome, and the urgent necessity for regular observation in order that their influence may be exerted to this end. In our recent report,¹ presented before the American Medical Association last May, we were able to show a complete follow-up of 188 cases out of 196 observed within the six year period covered in the report.

In figuring percentages of results, we consider that more accurate deductions can be made with less confusion and greater simplicity if the patients are classified as "living" after five years, instead of as "absolute cures," or even "symptom-free." We think also that percentages should be based on cases *traced*, and we should not include and consider as dead all those of whom we have lost track. As an example of this we recently had six patients who had not been in the follow-up clinic in from one and a half to four years who returned as a result of an intensive search, all in good health and clinically free from the disease.

PRINCIPLES OF TREATMENT

Ewing states that radium acts on cancer cells by autolytic degeneration, caustic destruction, and growth restraint. The principles on which we have based our method of treatment of cervical carcinoma rest on this theory. It is not advisable to use a dosage sufficiently powerful to destroy the normal cells and thus open up portals of entry for a rapid extension of the malignancy. The beneficial effects that we hope to obtain are the result of the death of the cancer cells only, plus the restraining of the growth of those tumor cells which may have escaped, by the interference with the capillary, venous, arterial, and lymphatic circulation, due to the action of the radium on the proliferating connective tissue. The choking off of the blood and lymph supply as a result of contraction following irradiation means starvation and imprisonment of the remaining cancer cells that have been within the reach of the rays. This is in accord with the views of Ewing and McCarty and of Clark and Keene.

An example of this action of irradiation, whereby malignant cells may be isolated and walled in so as to nullify them, is illustrated in a report of a case in the *Annals of Surgery*, March, 1925, by DeWitt Stettin, who did a radical amputation of the breast for a large-celled alveolar carcinoma, followed by a course of x-ray therapy. A nodule developed one year later which had all the appearances of a typical supraclavicular lymph node metastasis. This nodule of the deep-seated glands which was firmly fixed has remained stationary for five years, and the patient is in excellent health. Dr. Stettin believes that the arrest is due to the isolation of the cells by the scar tissue formation as a result of the x-ray application.

The contraction and cicatrization following the healing after radium therapy is well known. We believe that this accounts for the fact that the results that have been obtained by observers who only have a limited supply of radium at their disposal (100 to 200 mg.), equal those of clinics where very large amounts are available. We doubt whether the application of massive doses can show any better ultimate results than the intelligent application and reapplication of smaller doses.

We start with the principle that every case of cancer of the cervix is a study in itself, and that there can be no uniform or standard dose for the treatment of all cases. Our first dose is regarded as a test dose, usually from 2400 to 3600 mg. hours, and we judge of the effect in that particular case by a careful observation of the conditions existing at the end of six to eight weeks. We think we can tell from the general appearance of the growth whether the several stages of hyperemia, local destruction of tissue, formation of local sloughing, beginning healing process, complete healing, and final cicatrization with marked contraction, which represent the phenomena of irradiation of

the cervix by radium as described by one of us,² are progressing satisfactorily or not. We have tried to learn what the picture should be at the end of each postradiation month. At the end of the third month we expect to find the markedly contracted cervix and vaginal vault of firm consistency with the pallor characteristic of anemic tissues. Later one may observe ecchymotic spots with slight capillary oozing that is not characteristic of carcinomatous erosion; we believe this is due to superficial shedding of epithelial cells, the result of the dwindling blood supply; is analogous to the ecchymosis we frequently see in senile vaginitis, and should not be confounded with a recurrence.

If at the end of the first or second month we find the postradiation stages progressing satisfactorily, we do not reradiate at that time. We observe the patient each month and as long as the conditions remain quiescent and symptomless, continue the watchful waiting. Should there be evident unsatisfactory progress in the postradiation stages during the healing period of three months, or should any sign of rekindling of the malignant process after complete healing manifest itself by an erosion, bleeding, or nodule, we at once reradiate, using a dosage and technic commensurate with the conditions present. In contradistinction to the views of many observers, our experience has been that repeated irradiations in certain of the advanced cases have been of distinct value. In fact some of our five year cases of this class were apparently saved by three or more reradiations. It is to be noted that many of our reradiations consist of the implantation of needles only in suspicious areas. In our experience the monthly inspection is essential to safety. During an interval of three to six months a recurrent malignancy can gain such headway that a serious conflagration may need to be extinguished. If there is an opportunity to plant a needle at the onset of the recurrence, the problem is much simpler, as the chances of smothering the fire during its incipency are greater.

As we consider it important to study the result of the first or test dose, we do not believe it advantageous or logical to give a series of repeated treatments at short intervals as is done in some clinics. We require a sufficient time after the initial dose for the changes to take place in order that the character of the response to the irradiation may be judged. One case may require only the test dose to produce a satisfactory result; another may require several repeated doses at varying intervals, but not closer than six or eight weeks. We see no other way to avoid overirradiation with extensive and undesired necrosis of tissues if we do not thus feel our way in each case.

TECHNIC

The technic of application that we employ has been described by one of us in a preliminary report of our work² and is similar to

that in general use. It is important that a careful vaginal and rectal examination should be made in order that an accurate knowledge of the extent of the disease may be ascertained. A cystoscopic examination is also necessary in advanced cases. Care should be taken, however, to avoid all unnecessary trauma in the bimanual palpation, as there is a distinct danger of a dissemination of the cancer cells beyond the growth. We believe that anchoring of the radium by suture in situ should be done wherever feasible, as it is important to insure the action of the rays in the desired area for the required time. In one of our earlier cases in which the tube was placed in the cervical canal without suture, it was found, when the uterus was subsequently removed, that the tube had evidently slipped up beyond the internal os, as the bulk of the irradiation had been exerted in the body just above the cervix. We employ the brass and rubber screening of the radium tube to filter out the harmful rays, and distance screening with vaginal gauze for the protection of the bladder and rectum. As a rule we prefer the short needle to the long Lee needle, believing it safer and simpler to use with the vaginal packing. As it is necessary for the vaginal gauze to be packed tightly in order to distend the vaginal walls to the utmost to insure proper distance screening, the patient must of necessity be catheterized during the time the treatment is in progress. As this is often difficult on account of the packing, we have found the insertion of a self-retaining catheter during the time of the radium application to be very satisfactory to all concerned.

SIGNIFICANCE OF THE RESULTS

As stated in our recent report, our results for all classes of carcinoma of the cervix treated with radium alone on the above principles show 23.6 per cent living for five years or more. Our results in the Class I and II cases, that is those in which the disease had not extended beyond the cervix, show 52.9 per cent living five years or longer.

The significance of these later figures must be apparent. If we can get patients with carcinoma of the cervix to seek relief *early*, before the disease has made much headway, we may hope to obtain a relative cure in at least 50 per cent without operation. These cases were frankly "operable" cases and have the advantage in comparison with the 25 per cent or 26 per cent claimed for the Wertheim operation, especially when we consider the primary operative mortality. We, of course, appreciate that the definition of "operability" has varied considerably in the Wertheim reports, but when we consider the expert technical training necessary for the proper execution of the radical operation and its primary mortality, we believe that the preponderance of evidence is in favor of radium alone for the treatment of carcinoma of the cervix. The question of operation (simple panhysterec-

tomy) *versus* radium in very early cases of cancer of the cervix, which would be considered as Class I cases, is often debated. Personally, we believe that both methods will cure equally, with the nonoperative mortality in favor of the radium, but at the present time this is a question we rarely have to decide, as so few cases seek relief at this very early stage. We have only three cases recorded as Class I in 196.

We do not operate after successful irradiation for cervical cancer for fear of breaking down the connective tissue barriers and releasing possibly active cancer cells which have been imprisoned by the action of the radium. We are not satisfied at the present time that those who do operate after irradiation can show any better ultimate results than the clinics giving statistics for radium alone.

It seems obvious that the work of educating the laity to seek a diagnosis at the very onset of suspicious symptoms is of paramount importance, in view of the satisfactory results obtained with the radium treatment of cervical cancer in at least 50 per cent of these early cases. The vital importance of the propaganda being carried on by the Society for the Control of Cancer cannot be overstated. There is an urgent need of educating the family physician as well as the laity to the great importance of paying attention to suspicious symptoms in their incipency. Procrastination and failure to make a vaginal examination are far too common.

Apropos of this it is of interest to note the length of time that elapsed between the onset of symptoms and the first seeking of medical advice in our series of cases.

In the 177 cases in which this was definitely stated the average duration of symptoms was about seven months. There were only 10 cases who sought advice at the earliest interval of one month. There were 13 who waited for two years or more. Of the three Class I cases that occurred in the 196, one came after one month, one after three months and one after four months. There were 44 cases in Class II, and the average duration of symptoms in these two classes combined, which represent the disease as limited to the cervix, was about five months. These are the cases in which we may expect to cure 50 per cent, yet precious months were allowed to slip by before relief was sought by the majority. In the 146 advanced cases, Class III and IV, the average duration of symptoms was eight months.

THE RELATION OF TYPE OF CELL TO DEGREE OF MALIGNANCY

It will be helpful in the prognosis of these cases if the attempts that are being made to determine the relation of the type of the cell to the degree of malignancy should prove to be successful and practical. According to a recent statement of Greenough, this would seem to be possible in carcinoma of the breast, but, although efforts have been made by Martzloff and others to determine the relative degree of

malignancy of cervical cancer according to the cell type, their results are open to question, owing to the many complicating factors present. Recent publications from the German clinics are practically uniform in the opinion that histologic prognosis is not practicable. We were interested in having our cases studied from this standpoint, and Dr. Plaut, the Pathologist of the Woman's Hospital, has made an exhaustive study of our slides, independent of our clinical results, and his conclusions are that a satisfactory prognosis cannot be made from the type of cells present. Dr. Plaut's paper will shortly be published.

We realize the difficulties in the problem when we appreciate that the squamous cell type is the slowest growing and the least malignant yet the most resistant to irradiation, while the reverse is true of the most malignant spindle-cell type. We may therefore have to give a more intensive treatment in the less malignant type of case to obtain a satisfactory result. The slower progress of the disease in the squamous or spindle-cell types may give an apparently longer life from the radium therapy, while the more malignant spindle-cell types yield more quickly to the irradiation, yet recur more quickly.

We consider that the constitutional state of the patient is an important factor in the prognosis. We know that there is an absorption of autolytic and nitrogenous waste products as a result of the action of the radium on the tissues, and this may be a serious load to an already handicapped system. The resistance of these usually anemic patients can be materially fortified by a prophylactic blood transfusion, and it is our custom to give 500 c.c. of blood a few days before irradiation in cases needing it, thus enabling them better to combat the toxins absorbed as a result of the treatment.

CARCINOMA OF THE CERVICAL STUMP

The occurrence of carcinoma in the cervical stump left after a supravaginal hysterectomy is of perennial interest, and whether a panhysterectomy should be a routine procedure or not is still a debatable question with some surgeons. In a five year period we had eight such cases and during this time 600 supravaginal hysterectomies were done. During the past seven years we have seen eleven cases and in the same period there were 872 supravaginal hysterectomies. Of these eleven cases, however, only four were previously operated upon in the Woman's Hospital. The incidence therefore is probably less than 1 per cent. These eleven cases have all been treated with radium alone, and in Class I, there was one case; in Class II, three cases; and in Class III, seven cases. The time since the operation for supravaginal hysterectomy until the radium treatment, the duration of symptoms, and the results to date are shown as follows:

CARCINOMA OF CERVICAL STUMP

	TIME SINCE OPERATION	DURATION OF SYMPTOMS	RESULTS
CLASS I	At Woman's Hosp. 1 yr.	1 Month	Living now 3 yrs.
CLASS II	" " " 3 weeks	Ca. Diag. from tissue taken at operation	Living now 6 yrs.
	" " " 2 weeks	Cervix neg. at time of oper., Ca. of cervical polyp, inside canal	Living now 4 yrs.
	" " " 4 years	12 months	Living now 3 yrs.
CLASS III	Oper. Elsewhere 2 yrs., 9 mo.	6 months	Died 1½ years
	" " 10 yrs.	5 months	" 2½ years
	" " 3 yrs.	2 years	" 2½ years
	" " 3 mos.	Not stated, apparently Ca. present at operation	" 4 months
	" " 3 yrs.	8 months	Now living 2 yrs.
	" " 5 yrs.	4 months	Died 1 year
	" " 10 mos.	12 months. Apparently Ca. present at operation	" 6 months

The incidence of carcinoma of the cervical stump after supravaginal hysterectomy is so low, that there is a probability that it would be offset by the slightly higher mortality of panhysterectomy.

CARCINOMA OF THE FUNDUS

It is generally agreed that a panhysterectomy gives such a high percentage of five year cures in carcinoma of the fundus that it is the method of choice. In our experience, however, a large percentage of patients with this condition are such poor operative risks that we have been forced to forego the operation and to use radium only in many of them. In the six year period from 1919 to 1925 we have had 54 cases of fundus carcinoma. We have treated 25 with radium alone, 11 with radium and operation, 14 with operation alone, and two with roentgen rays alone, and two no treatment (one refused and one too far advanced). Thus in 51.9 per cent we did not operate because of the poor operative risk. In classifying these cases as to risk, 41 per cent were considered as good and 59 per cent as poor. Thirty-two were over fifty years of age; 11 were over sixty; two were over seventy.

Obesity, old age, cardiovascular disease, deficient renal function and diabetes were the complications present in over 50 per cent of our cases; consequently we had little choice but irradiation in these patients.

Our end-results in these 52 treated cases of carcinoma of the fundus show that 30 are now living; 20 are dead, and two have not been traced to date. Of the 25 cases treated by radium alone, nine are within the three year period; all have been traced, and four are living three years after treatment, or 44.4 per cent. In the five year period there were three treated; three traced, and none living. In the seven cases treated with radium and panhysterectomy, three are in the three year period; all were traced; three are living, or 100 per cent. There are none in the five year period. (In addition, there were four

cases which cannot be placed in this group, owing to the method of treatment, namely, one case had two radium treatments followed five months later by supravaginal hysterectomy, and died in two years. Another had a panhysterectomy and radium five months later for recurrence and was dead in two years. A third had radium and six months later an exploratory laparotomy, was found inoperable, and died three days postoperative. The fourth case had radium and one year later an exploratory laparotomy; was found inoperable, and died in two years.)

Of the 14 cases treated by operation alone, in the three year period, 9 were treated; 9 traced; 8 are living, or 88.8 per cent. In the five year period 7 were treated; 6 were traced, and 4 are living, or 66.6 per cent. In 2 cases treated by x-ray alone, one is living, for three years, and one died in one year.

Thus it would seem that the operation alone or radium and operation combined gives the best chance for the five year cure.

ROENTGEN RAY THERAPY

We have no data of value to contribute on x-ray therapy. We have not the high voltage machine at our disposal, and our employment of x-ray therapy of moderate voltage, which we carried out on a considerable series of our cases as a postradium treatment, proved far from beneficial in the large proportion of the patients, and apparently positively harmful to some. Certainly we can show no more satisfactory results where we have employed the roentgen rays in conjunction with the radium than with the radium alone. Therefore, we have abandoned it for the present, until such time as evidence can prove to us that the technic and dosage have been placed on an indisputable ground in producing effective results.

SUMMARY

1. For purposes of comparative study a standardized simple classification of the extent of the disease, and the same rules of estimating end-results and percentages, should be adopted by all clinics.
2. A monthly follow-up conducted in person by the surgeon in charge of the patient is of inestimable value as a factor in the successful treatment.
3. The details of technic are important. Especially should over-radiation be avoided, and subsequent treatment should be based upon the reaction to the test dose of radium. This does not permit of employing repeated doses at short intervals, regardless of the response to the *first* dose of radium.
4. In our experience repeated irradiations, three or more, have been of distinct value in certain advanced cases.

5. By watchful waiting it is often possible to extinguish the fire that is rekindling, before it has gained much headway.

6. According to our results radium alone is preferable to surgery in all classes of carcinoma of the cervix.

7. As at least 50 per cent of the early cases of carcinoma of the cervix can be saved by radium, the importance of educating the laity and the family physician to seek an early diagnosis is imperative.

8. While carcinoma of the fundus is best treated by surgery, many times the operative risk is poor and resort must be had to radium and roentgen ray therapy.

9. Large amounts of radium are not necessary to produce satisfactory results.

10. The value of roentgen ray therapy in carcinoma of uterus is still an undetermined question.

11. Every case of carcinoma of the uterus should be individualized and treated accordingly.

12. The ideal therapy for carcinoma would be one that would reach the malignant cells wherever located. Should Blair Bell's theory be right that carcinoma is a "specific growth process," the result of an atavistic throwback of the normal cell to its early embryonic type, which has potential malignant characteristics as a result of a failure of its restraining hormone, and if that hormone or some substance that is lethal only to the malignant cell can be found for intravenous therapy, we will welcome it as one of the greatest blessings of mankind. But until that time we must continue to rely on surgery and irradiation as the only means at our disposal that have been of value in combating this terrible disease.

REFERENCES

¹Ward and Farrar: Radium Treatment of Carcinoma of the Cervix Uteri. Results at the Woman's Hospital after Five Years, *Jour. of Am. Med. Assn.*, July 18, 1925, lxxxv, 159-162.

²Farrar: Preliminary Report of Primary Carcinoma of the Cervix Uteri Treated with Radium in the Woman's Hospital in the State of New York, *AM. JOUR. OBST. AND GYNEC.*, August, 1925, x, No. 2.

48 EAST FIFTY-SECOND STREET.

611 WEST ONE HUNDRED TENTH STREET.

PRECANCEROUS LESIONS OF THE UTERUS*

By PALMER FINDLEY, M.D., F.A.C.S., OMAHA, NEB.

APPROXIMATELY 13,000 women died of cancer of the uterus in the United States in 1924. Appalled by this frightful mortality we ask: "What can be done to lower the death rate?"

It must be apparent to all who are conversant with the cancer problem that we find little encouragement in scanning the records of surgeons and radiologists. True, there has been progress made in both of these fields, whether employed singly or conjointly, but such progress has been feeble and inglorious. We are not satisfied with the results, and we do not anticipate any considerable advance in the results of treatment through surgery, the x-ray or radium so long as cases present themselves in the advanced stages of the disease. We say that cancer is curable if taken in time, but how seldom do we see these cases while it is yet time to effect a cure! In my entire experience I have not seen more than three such cases. Frank has found but two cancers of the cervix which could not have been recognized without the aid of the microscope and no less an authority than Schottländer reports no more than 2 per cent of accidental finds in his laboratory work.

Inasmuch as there are no symptoms in the earliest stages of cancer of the cervix, little progress will be made in our efforts to educate the public if we limit our instructions to the admonition to consult a competent physician when suspicious symptoms arise. If we wait for symptoms we have usually waited too long. We must do more; we must admonish women who are passing through the cancer age to seek periodic examinations; not alone for the purpose of detecting cancer in the early stage of its development but, what is more profitable, to recognize the existence of precancerous lesions. "Prevention is better than cure" is an old adage that strikes us with added force in the consideration of the cancer problem.

No one is so bold as to assume an air of complacency in his management of cancer of the cervix. Most of us have acquired the attitude of Meigs, who said to his students in 1848, "It is enough to make a physician's heart sink within him to make the diagnostic of cancer uteri; for such a diagnostic is *ipso facto* a prognostic of death; and when the physician has made it, and is brought to the point of giving true expression to his opinion, he might be supposed to be as painfully situated as an English judge when he puts on his black cap before the final pronouncement unto death." Meigs was speaking before the days

*Read at the Thirty-eighth Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, held at Hot Springs, Va., September 16, 17, and 18, 1925.

of hysterectomies, x-rays and radium, yet he knew that cancer did not arise from healthy tissues; said he: "There is always an antecedent state of alteration of tissue; a state which lays the foundation for the mild evolution and increase in cells." He believed that the time to cure cancer was before it had become a cancer.

To my mind, the only means at our command to lower the death rate of cancer of the cervix materially is to attack precancerous lesions in the cervix. I believe that the major portion of cancers of the cervix are preventable. These precancerous lesions are well known; they are easily recognized, and by intelligent and diligent management they can be eliminated.

I do not believe that uncomplicated lacerations of the cervix constitute a precancerous lesion. Schottländer says he has never seen a cancer develop from the site of a laceration in the absence of erosions and ectropion. While lacerations are frequently associated with cancer of the cervix, observations on the early cancers demonstrate that cancer begins anywhere on the surface of the cervix except in the laceration. Bonney, on the other hand, has never failed to find evidence of a preexisting erosion in all early cancers of the cervix. Exposure of the delicate columnar epithelium, which forms the surface of an unhealed erosion and of an ectropion, to the irritating acid secretions of the vagina, to the insults of the vaginal walls, and to the constant attacks of microorganisms which abound in the vagina, predisposes to the development of cancer. Erosions and eversion of the cervix constitute potential cancers, and, viewing them as such, our efforts should be directed toward the repair of lacerations and the treatment of endocervicitis, because these are the forerunners of eversion and erosions of the cervix, just as the latter are the forebears of cancer.

There seems to be no consensus of opinion as to what constitutes precancerous lesions of the cervix. Various interpretations have been placed upon the structural changes which antedate the development of cancer in the cervix. Epithelial cells that are enlarged, irregular in size and outline with hyperchromatic nuclei and indistinct border outlines characterize malignancy in the opinion of Schottländer, while Pick looks upon such changes as indicative of regeneration. Ewing goes one step further and says that we are dealing with early carcinoma when to the above features there is added the downward growth of epithelial papillae and definite heterotopia. Rubin is quoted by Ewing as finding many phases of precancerous lesions in old erosions of the cervix where there is proliferation of atypical cylindric and squamous cells, both superficially and in the glands. It is generally conceded that epidermization of the cervical canal does not inevitably constitute a precancerous lesion, but it is from such alterations of the cell structure that cancer usually arises. I think all will agree with Ewing that, "when atypical hypertrophic and hyperchromatic cells are growing

downward from the epidermis or fill enlarged gland alveoli, the diagnosis of beginning carcinoma is justified." It is small wonder that experienced pathologists differ in their interpretations when there is so great an intermingling of squamous and cylindric epithelium on the surface and in the glands.

Thomas Wilson of Birmingham, in speculating on the inception of cancer, says it may be that the precancerous condition is already malignant or that the precancerous condition "prepares the ground, so to speak, in which the cancer seeds are enabled to germinate; or, further, it is conceivable that the condition represents the first attempts of the body to protect itself against cancer that is already implanted, or is in process of evolution."

Frank takes issue with Ewing, Schottländer, Shanenstein and Rubin, whom he styles as radical pathologists, who "classify as beginning cancer conditions which, lacking as we do absolute histologic criteria of early malignancy, may as well prove to be harmless epithelial proliferation." Frank protests against the tendency to remove uteri on suspicion only. In his admirable monograph (*Gynecological and Obstetrical Pathology*, Appleton) Frank says that this tendency "has led to a craze for hysterectomy compared to the Batty craze for oophorectomy of the late seventies," and questions "whether the mortality of complete hysterectomy does not far exceed the problematic prophylactic gain." The confidence of Frank in his diagnostic acumen is revealed in the expression: "A carcinoma is unmistakable and, in accord with Liebharch, the writer must insist that, while a specimen may be suspicious, in a given case we are dealing either with a cancer or not." Where doubt cannot be expelled, Frank would counsel watchful expectancy by a competent observer for a few weeks when a new exploratory incision can be made or more definite, though still early, signs develop.

I cannot subscribe, either in theory or in practice, to the conclusions of Frank. We occasionally encounter borderline cases which baffle both the clinician and the pathologist. In such cases I believe delay to be hazardous and that it is the part of wisdom to regard all such cases as malignant.

Precancerous lesions of the corpus uteri are commonly designated as fibroid tumors, polyps and hyperplasia of the endometrium. When we recall that fibroids and cancer of the body of the uterus are associated with far greater frequency than are fibroids and cancer of the cervix, it is fair to assume that there is a causal relationship. If such there be, then we may further assume that the endometrial changes accompanying fibroids of the body of the uterus constitute a precancerous lesion.

While benign polyps may become malignant, I am of the opinion that many errors in diagnosis made by the pathologist are due to multiplication and stratification of the epithelium.

So-called hyperplastic endometritis is unquestionably a precancerous lesion and the line of demarcation between the benign and the malignant cannot always be discerned by the most competent pathologist. Great increase in number and irregularity of the gland structures may present a most perplexing problem. We must, however, recognize the fact that increase in the cell-layers lining the surface and glands of the endometrium is not evidence *per se* of malignancy; nor is epidermization a necessary approach to malignancy.

Benign epidermization of the endometrium is not an uncommon finding as the result of curettage followed by the application of escharotics and as an accompaniment of pyometra. We occasionally see such apparently benign changes in the endometrium associated with cancer of body and cervix. While recognizing the occurrence of epidermization as a benign lesion, I would regard extensive changes of this sort as the precursor of cancer. In all cases where great irregularity in cell form and size, atypical mitosis, and hyperchromatism are found, the diagnosis of malignancy is established.

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(For discussion see page 519.)

CERVICITIS, EROSION AND LACERATION OF THE CERVIX UTERI FROM THE STANDPOINT OF PATHOLOGY

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THERE is scarcely a field in medicine where such a woeful lack of unanimity exists as in the treatment of cervical infections. In part this is undoubtedly due to a failure in giving due consideration to the protean aspects of the underlying pathology. A further abetting factor is the rather confusing terminology employed; erosion, pseudo-erosion, ectropion, etc., are used indifferently and without due regard as to what these terms actually mean.

In order to gain an adequate idea of the pathology of the cervix, we must first examine the normal cervix, not only in its later stages but also in its embryologic development. The müllerian ducts form the tubes, uterus, cervix and vagina. At first, the müllerian tubes are lined throughout by the same type of columnar epithelium, but changes soon take place and form the four different mucus membranes found at birth in the different portions of the female genital tract. Postnatally the fallopian tubes are lined by ciliated columnar epithelium. The uterus likewise shows columnar epithelium with, however, only a few patches of cilia and here and there some scattered secreting cells. At a still later date the characteristic tubular glands and their cytogenic stroma also develop here. In the cervical canal the epithelium is a mucus se-

creting epithelium with many racemose glands which penetrate rather deeply into the musculofibrous tissue of the cervix. In some textbooks the lining epithelium of the cervix is described as ciliated, but this is not correct. The cervical glandular epithelium is a direct continuation of the epithelium of the cervical canal, and, as the cervical glands secrete mucus, we see that cilia are not to be expected here, as a ciliated epithelium is not a mucus secreting epithelium. The cervical and uterine mucous membrane has a very definite line of demarkation at the isthmus uteri. This line of demarkation usually corresponds to the anatomic internal os. In some cases a slight invasion of the two types of mucous membrane into each other is seen at their junction, but this zone is never more than one millimeter broad, even in the adult. The mucous membrane of the cervix, however, differs not only in structure from the uterine mucous membrane but also in that it does not pass through the cyclic (menstrual) changes which involve the endometrium during the sexual life of woman. Even the mucous membrane of the isthmus uteri, similar though it be to the mucosa of the uterus, usually participates only slightly in the menstrual phases.¹ In addition to the difference of their respective mucous membranes the body of the cervix also differs from the uterine wall in being firmer and containing more fibrous connective tissue. Occasionally small lymph follicles are seen in it, as shown by a number of slides in my possession.

It is in the vagina that we see the greatest change in the original epithelial lining of the müllerian ducts. Here squamous cell epithelium, growing from below upwards, replaces the original columnar epithelium. Normally this squamous cell growth not only comes to line the whole vagina but also at first penetrates into the cervical canal. It is found there in the sixth month of fetal life and often even later (see Fig. 1), but is nearly always again pushed out and replaced by the columnar epithelium which represents the normal lining of the cervical canal in later life. Nevertheless, remnants of squamous epithelium may persist here. Consequently, the presence of squamous cell epithelium in the adult cervix does not necessarily mean a metaplasia, and, therefore, is not in itself to be regarded as evidence of a previous inflammatory process.

In about one-third of all cases² the columnar epithelium of the cervical canal, instead of pushing out the squamous cell epithelium only as far as the external cervical os, grows beyond it to a varying degree on to the outer surface of the portio. We have, as a result, an external os surrounded by an area of columnar epithelium. Macroscopically such an area will appear as a reddened zone and has been called a *congenital erosion*, better *pseudoerosion* (R. Meyer). Such a condition, though called erosion, is of course nothing but a congenital anomaly of growth, but, to add further to the already existing confusion, congenital "erosions" are also called "*histologic ectropions*." This is likewise incor-

rect, as ectropion means eversion. The terms erosion and ectropion are, however, even more indefinite than they seem now, because they have also been applied to other histologically and etiologically different lesions of the cervix, as will be shown.

One would think that congenital pseudoerosion might cause trouble later on in life, but this is not the case, as these congenital anomalies usually heal, that is, become recovered by squamous epithelium. It is interesting to note in this connection that Courrier³ and others have



Fig. 1.—Longitudinal section of the cervical canal of a ten-year-old girl. At the lower part of the picture is seen the anterior cervical lip projecting into the vagina; EO indicates the external os, and XX the limits of the squamous cell epithelium in the cervical canal. The projecting wedge seen at the upper part of the photograph is due to the section passing through a projecting ridge of the left lateral wall of the cervix. It is not a polyp.

found that the injection of ovarian extract causes proliferation of the squamous cell epithelium of the vagina in the newborn. Courrier's experiments corroborate R. Meyer's findings of a "Verschleimung" of the vaginal wall in rodents and dogs during pregnancy when the ovarian function is diminished. It is possible, therefore, that the beginning ovarian function at puberty is a factor in the healing of congenital pseudoerosion and supplies the stimulus needed to cause the squamous epithelium to regain its normal location.

Based on the findings in the congenital pseudoerosion, some pathologists have denied all cervical erosions to be anything but congenital misplacements. This opinion, however, is not correct, as we shall see directly.

Among the actual inflammatory lesions of the cervix we must first consider certain specific diseases. Syphilis, though rare, occurs at times either as chancre, mucous patch, or gumma, which do not differ from the same lesions anywhere else. Tuberculosis may affect the cervix as ulcers, miliary tubercles or, rarely, as small papillae on the surface of the portio.⁴ The last condition I have seen only once.

Generally an inflammation of the cervix is due to infection with the gonococcus or with the staphylococcus, streptococcus, coli bacillus, pneumococcus or similar bacteria although even parasites such as oxyuris or trichomonas may cause irritation. The infection arises locally as spontaneous, auto- or heteroinfection, or, at times, apparently is carried by the blood stream.

Some clinicians claim that gonorrheal infections produce a characteristic clinical picture. A thick mucopurulent discharge, for instance, is considered one of the indexes of gonorrhea. Such a discharge seems indeed to be frequent in gonorrheal infections but certainly is not pathognomonic. Others hold that infections of the nulliparous cervix are always gonorrheal. This statement is certainly too broad, because cervicitis, salpingitis and even peritonitis may at times occur spontaneously, for example, during the menstrual period, even in a *virgo intacta*. A specific form of cervical gonorrhea does indeed exist although it is seen very seldom. This latter disease is characterized by the formation of pointed condylomata on the cervix similar to those found so frequently on the skin in cases of gonorrheal infection.

In infections of the cervix we are dealing either with acute or chronic inflammation, and, histologically, the same morphologic differences are present as anywhere else in the body. Clinically, acute cervicitis is not as important as the chronic form, because it either heals rapidly or, more usually, becomes chronic. In both the acute and chronic forms of cervical infections we have a more or less purulent discharge, as the characteristic clinical expression of the disease. It is, perhaps, important here to call attention to the necessity of separating actual inflammations of the cervix from such cervical processes as, for instance, pregnancy and chronic hyperemia from any source, where the cervical secretion is increased but not changed in character. Secondary infection, of course, may also occur in cases of pure hyperemia and long continued congestion may, in any case, result in cervical hypertrophy and fibrosis. The original processes in simple hyperemia and infection are, however, definitely and distinctly different. Despite statements to the contrary, cervical polyps found in so many patients must not be considered *eo ipso* as evidence of a previous inflammation, any

more than the before-mentioned squamous epithelial patches in the cervical canal. In both affections, though, secondary inflammatory processes may be present.

Histologically, infections of the cervix may show desquamation of the epithelium of the cervical canal but usually only in severe cases. As a rule the desquamation affects the glands only very slightly, if at all. It is not the epithelium, however, but the stroma of the cervix that shows the greatest changes. All the histologic signs of inflammation are present here. In acute cases many leucocytes are seen; in less severe or more chronic cases lymphocytes, either scattered diffusely or in patches, and often many plasma cells are in evidence. The idea that plasma cells are in any way characteristic for gonorrheal infections is no longer tenable. In a large number of cases of chronic infection, both of the tubes and of the cervix, I stained for plasma cells and found them present in large numbers, irrespective of whether the process was due to the gonococcus or the streptococcus or staphylococcus.

Since the inflammatory reaction in the cervix, in contradistinction to the uterus, is never limited to the mucous membrane or endocervix, but extends out even as far as the squamous cell epithelium, covering the portio, the term "endocervicitis" should be given up, and the term "cervicitis" used as it corresponds more nearly to the actual pathology.

In addition to the processes described, other changes also occur in the cervix. One of these is the formation of cysts by obstruction of the gland ducts, and we have here one process by which the nabothian cysts are formed. Another change in the inflamed cervix may be the production of an ectropion, especially in acute conditions. Such an eversion or protrusion of the mucous membrane of the cervical canal (inflammatory ectropion) is due only to the inflammatory hyperemia and resembles the same process seen in other locations, especially in the urethra.

Such an ectropion must not be confused with what is ordinarily called cervical erosion. This latter process has been especially often misunderstood. In severe inflammatory conditions, the squamous cell epithelium covering the portio may be desquamated just as the cervical canal epithelium in similar lesions. When such a process occurs around the cervical os we have clinically, a reddened area around the os and, histologically, a true erosion, specifically called *erosio granulans*. The surface of such an erosion has no epithelial covering but shows purulent, or fibrinous deposits or granulation tissue. Usually such histology is not of long duration, as the denuded surface becomes covered by columnar epithelium, which is more resistant to maceration than squamous cell epithelium. When this occurs we are again, as in the congenital lesion, dealing really only with a pseudoerosion or with what Fränkl, I believe, rightly considers as the first stage of healing of the

inflammatory erosion.⁵ We see then that the pathologists who claim that all cervical erosions are congenital displacements are in error. At the same time it seems that the epithelial changes which occur embryologically in this region leave a rather unstable balance between the columnar and squamous cell epithelium. It may very easily be that the frequency of inflammatory cervical erosion is influenced very markedly by such an epithelial imbalance.

There has been much discussion regarding the derivation of the columnar epithelium in inflammatory erosions. The idea that the epithelium is derived from the basal cell layer of the squamous cell epithelium, believed by some pathologists (Ruge,⁶ Veit⁷), must be discarded. The epithelium is derived either by direct extension from the cervical canal epithelium or from some of the superficially lying cervical glands which easily can and do reach the surface of the portio.⁸ Probably both sources are to be considered, even in the same case.

The columnar epithelium of a cervical erosion may be a single smooth layer or may connect directly with the superficial cervical glands. Depressions, indentations and actual ingrowths of the erosional surface epithelium may also develop (*erosio glandularis*). This is not strange, inasmuch as the cervical epithelium may be expected to retain its characteristic ability to form glands, even though located on the surface of the portio instead of in the cervical canal itself. We also know that inflammation of the tissues in itself may produce a penetration of glandular structures into the underlying tissues. This is seen, for example, in the gall bladder and intestine, to cite only two well-known instances. Sometimes an erosion is accompanied by the formation of cysts (*erosio cystica*) or many deep indentations are produced causing a papillary appearance (*erosio papillaris*). Even exophytic instead of endophytic growth is seen (*erosio polyposa*). The latter two, especially the last one, are, however, unusual. (R. Meyer,⁹ Kerwin,¹⁰ Geller.¹¹)

We see, therefore, that all the various forms which an inflammatory cervical erosion may assume are essentially only parts of one and the same process. We have also seen that nature's first attempt to heal the lesion is by covering it with columnar epithelium since the latter is more resistant to maceration. As the inflammatory process subsides, further attempts at healing of the erosion take place. The columnar epithelium in the course of events again becomes replaced by squamous cell epithelium (second stage of healing of Fränkl). This is achieved by a pushing of the basal cell layer of the squamous epithelium under the columnar epithelium, thus lifting off the latter. The squamous epithelium in the process grows across the mouths of such glands as may be present on the portio surface, and may, at times, even penetrate into the necks of these glands, but, as the glands themselves remain, another mode of formation of the ovula nabothi is given (Fig. 2).

Since the secretion of the undestroyed glands may either rupture through the newly-formed squamous cell epithelial covering or lift it off, and, since relapses of the inflammatory process may cause redsquamation of the squamous epithelium, the second stage of healing of an inflammatory cervical erosion is to be regarded only as a transitory stage. It results either in reformation of the erosion or leads on to the third stage or stage of definite healing, in which the squamous cell epithelium manages to replace the columnar surface epithelium at all points and also to fill out the glands. In this way squamous epi-



Fig. 2.—The photograph shows a markedly inflamed cervix with dilated partly cystic glands. The squamous epithelium at the top of the picture has grown across the mouth of two glands (second stage of healing) but at the upper left of the picture we see the gland again breaking through the squamous epithelial covering. The erosion temporarily healed is showing signs of recurrence.

thelial downgrowths occur which, to the inexperienced, may give the impression of malignancy.¹² At the same time careful investigation will reveal the basal membrane to be everywhere intact.

The growth of the squamous cell epithelium in a healing erosion is derived from the edges of the erosion and also from microscopic islands of squamous cells usually left in an erosion.

In the lacerated cervix we have all the possibilities hitherto men-

tioned, but, in addition, some other pathology, dependent only upon the laceration. One of these is the eversion of the cervical lips (*laceration ectropion*). In such instances the cervical os becomes surrounded by a reddened zone, which is apparently an erosion but which in reality represents only the everted, normally present mucous membrane of the cervical canal. The condition is the result of the pulling apart of the cervical lips by scar tissue shrinking. Such scar tissue shrinkage may also bury islands of columnar or squamous cell epithelium, which may become cystic, giving us still another mode of formation of the ovula nabothi.

It is important also in this connection to state that not infrequently in lacerations and eversions of the cervix the squamous epithelium grows further upwards into the canal than it does normally in an un-lacerated cervix. Here, apparently, we again have an effort of nature to replace abnormally exposed mucous membrane.

CONCLUSIONS

1. There is present, as an ontogenetic factor, a certain imbalance between columnar and squamous epithelium at the external os of the cervix uteri.
2. The so-called congenital erosion, due to an anomaly of growth, should be called congenital pseudoerosion.
3. Inflammation of the cervix may be acute or chronic. The acute form is of less importance than the chronic as it either heals quickly or becomes chronic.
4. The histologic changes in all cases of cervicitis, with the exception of certain specific cases, such as syphilis, tuberculosis and one or two other rare forms, are all the same. Gonorrhea, with one exception, does not exhibit any definitely characteristic features.
5. The term "endocervicitis" should be replaced by the term "cervicitis" as corresponding more nearly to the morphology present.
6. The inflammatory erosion of the cervix has a stage of actual true erosion and three stages of healing in which it is covered, first, by no epithelium at all; then by columnar epithelium; and in the last two stages by squamous cell epithelium.
7. An ectropion may be due to marked, especially acute, inflammation (*inflammatory ectropion*), or may be due to laceration and eversion of the cervical lips (*laceration ectropion*).
8. The type of epithelium found in a so-called erosion is no criterion as to whether the process is an erosion or an ectropion and even the microscope may find it hard to decide the question.
9. Nabothian cysts may be due to inflamed obstructed gland ducts or gland ducts closed by pressure from an inflammatory reaction as in erosions in the first stage of healing. They may also arise from glands

whose ducts are covered by squamous cell epithelium in the second stage of healing of an erosion, or again may be due to traumatically displaced and buried islands of columnar or squamous cell epithelium. This last origin is usually the result of lacerations of the cervix.

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30 EAST 58TH STREET.

ENDOMETRIAL ADENOMA (IMPLANTATION) IN THE VERMIFORM APPENDIX*

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THE chapter on newgrowths of the appendix is peculiarly complicated. One group, the so-called pseudomucinous tumors, almost defies judgment. Sometimes this variety of tumor runs an appallingly malignant course; in other instances, it responds as kindly to treatment as does the simplest chronic inflammation. Even after studying innumerable serial sections, I have been unable to determine whether I was dealing with a malignant or a benign process. A careful study of the literature does not resolve the uncertainty and doubt. If the patient recovers, we are content to call the disease "pseudomyxoma peritonei"; if death occurs after a period of marked physical decline and cachexia, we are almost forced to entertain the thought that the disease was "disseminated colloid carcinoma," without typically demonstrable cell pictures.

A second group of the perplexing tumors of the appendix are the so-called carcinomata. Here we may be able to predict the course of the disease with a fair degree of certainty, or we may, again, be confronted with great difficulty in correlating microscopic findings with the future course. The frank adenocarcinoma or the colloid type of adenocarcinoma with well-marked proliferation of alveoli, is a definitely malig-

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nant disease, comparable to adenocarcinoma elsewhere in the intestinal tract. The medullary type, however, furnishes an entirely different problem. These tumors practically never recur, metastasize or kill. It is doubtful whether we can continue much longer to call this type of growth carcinoma. In my own limited experience I have never seen recurrence, metastasis or death follow the removal of this type of tumor, and I have been inclined strongly to regard these tumors as endothelioma of a rather inactive type clinically. Ewing¹ says: "In some cases (of carcinoma of the appendix) the epithelial cells possess little growth capacity and become more intimately incorporated with the increasing stroma, so that the structure resembles that of endothelioma arising from

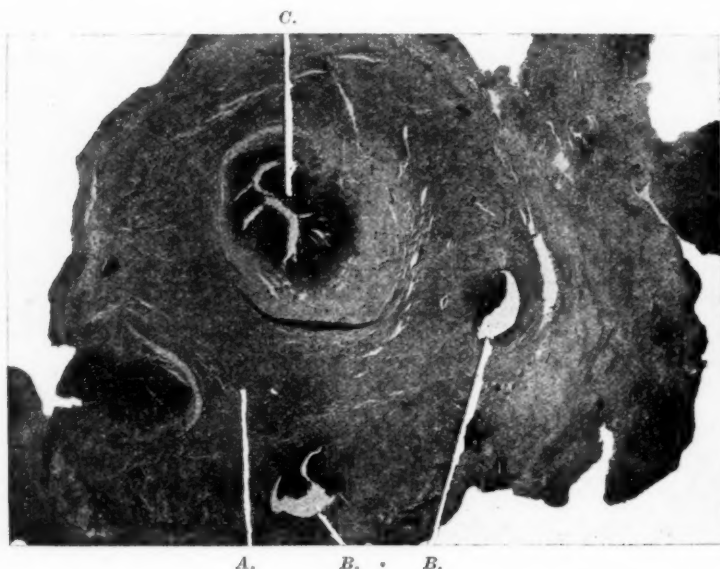


Fig. 1.—Low power picture of section transversely through appendix showing lumen, wall of appendix, and endometrial tissue. Note the marked hypertrophy of muscle coats (myoplastic reaction). A, Wall of appendix; B, endometrial tissue; C, lumen of appendix.

the lymph spaces of inflammatory connective tissue. These cases have apparently been interpreted as endothelioma by Glazebrook, Kelley and others. Sudsuki and Millner regard the structure as indicating an inflammatory origin, and hold that the great majority of carcinomata of the appendix are spurious." McWilliams² comments on the remarkable fact "that primary cancer of the appendix which microscopically appears to be a malignant growth is a relatively benign tumor when viewed clinically, since it does not tend to involve the lymphatics nor to form metastases. Recurrences after operation are almost unknown." Of course, the above quotations must not be construed to mean that carcinoma of the appendix may not run a very rapid course, spreading, involving the cecum and regional lymph nodes and destroying life.

McWilliams quotes a series of seventy-nine cases of carcinoma of the appendix reported by Rolleston in which there was a 1.2 per cent of recurrence after operation. The point is this: The surgeon, in attempting to set a prognosis in tumors of the appendix has, for years, been confronted with the perplexing problem of interpreting the colloid tumors and the carcinomata that attack this organ.

More recently, the confusion has been increased by the description of a new type of cellular invasion of the appendix, endometrial implants. Here, however, the problem is not due to difficulty in predicting the course of the disease, but rather to the fact that we have not familiarized ourselves with the pathologic gross and microscopic pictures of these endometrial implants, and that we therefore do not recognize the disease confronting us. These endometrial implants are, in all probability,

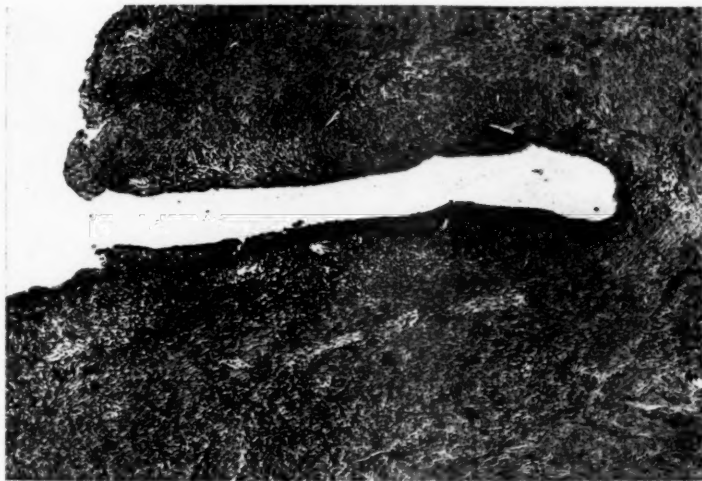


Fig. 2.—Uterine gland penetrating into wall of appendix from surface.

going to prove to be much more frequent in occurrence than present figures seem to warrant. In several respects they resemble carcinoma clinically and microscopically, and yet both clinically and microscopically, they are clear cut in their benignancy. The study of these tumors has, up to now, commanded the attention only of the pathologists and gynecologists. It is imperative that surgeons should also become familiar with this chapter of the pathology of disease of the appendix; and it is on the basis of this need that the following case history and comments are published.

Mrs. W., a thirty-seven year old nulliparous woman, was sent to the hospital four days after an abdominal crisis following the eating of raw pineapple. A few hours after the ingestion of the pineapple, severe cramps set in accompanied by moderate vomiting and a mild diarrhea lasting two days. She thinks she had a pronounced elevation of fever during the first day of the attack, but no chill. The cramps continued up to the time of admission to the hospital.

The family and the past history did not contain any facts bearing significantly on her present illness, except that she has had drenching night sweats, suggesting the possibility of tuberculosis (ileocecal). In June, 1922, two years before the present illness, she complained of general body pains and malaise and was examined with negative results. Ten years ago she had a similar attack, also following the eating of pineapple. The menstrual history was negative, and there is no statement in her case record establishing any relationship between her abdominal pain and menstruation. Urine, stool, stomach content and blood Wassermann examinations were negative. The blood count showed, 4,480,000 red and 4,800 white cells, hemoglobin 90 per cent. Abdominal examination revealed an area of exquisite tenderness, the size of half a dollar, located on the right side, two finger breadths above Poupart's ligament and two inches internal to the anterior superior spine of the ilium. There was no muscle spasm, no rebound pain and no evidence of general peritoneal involvement. Vaginal examination disclosed in the right vaginal fornix an egg-shaped mass, ten-



Fig. 3.—Endometrial tissue (gland and stroma) near lumen of appendix. A, Mucosa of appendix; B, endometrial tissue (gland and stroma).

der, elastic, and closely connected with the uterus, which was in anteversion, of normal size, movable and not tender. The mass extended well up to the point of abdominal wall tenderness. The case history records my impression as follows: "This mass is too low to be assuredly of appendicular origin and extends up too high to be assuredly adnexal in origin. The symptoms point to intestinal disease. Ileocecal tuberculosis must be borne in mind. Observation is advised." X-ray studies of the intestinal tract were negative. A note on the history next day records: "In view of the fact that the patient complains of general abdominal pain after taking food, I am beginning to feel that the pelvic condition (if it is tubo-ovarian) is incidental to a major lesion in the cecum or appendix."

Eleven days after admission to the hospital, there was so much distress following eating that it was decided to perform an exploratory operation. During these eleven days, there had been no fever, and repeated examinations had failed to furnish any conclusive evidence leading to a definite diagnosis.

Exploration disclosed a mass the size of a hen's egg attached to the flare of the ileum. The fimbriated end of the right fallopian tube was fused in the mass. Right ovary, left appendages and uterus normal. The cecum was involved in the mass, but the appendix was not demonstrable. By blunt finger dissection the mass was mobilized, releasing the cecum from the ileum. The posterior surface of the cecum was ragged and friable, bled easily and freely, and was covered with a layer of grayish green fibrin. A mass about the size of a pecan was felt in the posterior wall of the cecum. By blunt dissection this mass was freed and proved to be an inch long appendix, coiled on itself like a snail shell. The bed occupied by the posterior wall of cecum and appendix was made up of a vascular granulation-like tissue that strongly suggested carcinoma. The appendix was removed and the wound closed around a small rubber dam drain. Gross examination of the appendix showed that it was completely stenosed at its middle point. The distal segment contained imprisoned feces. There was no demonstrable perforation.

Dr. George Ives, pathologist to the Jewish Hospital, was at a loss to explain the

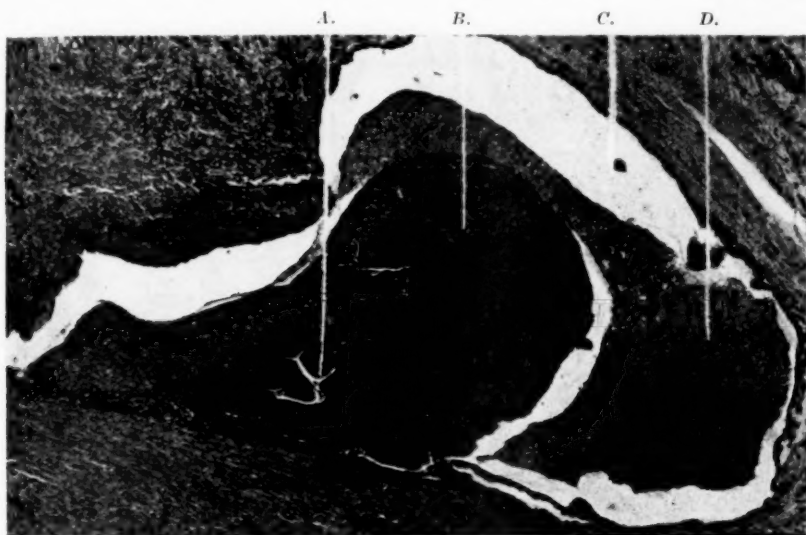


Fig. 4.—Cavity within wall of appendix partially filled with blood clot and with endometrial tissue. A, uterine gland; B, stroma; C, cavity in wall of appendix; D, blood clot.

presence of acini in the wall of the appendix and made a tentative diagnosis of adenocarcinoma. After more thought, he reached the conclusion that he was dealing with a case of endometrial implantation. Dr. Otto Schwarz, to whom I am indebted for many courtesies in connection with this report, concurred in the opinion of Dr. Ives. I am certain that, had I been alert or properly qualified, I would have realized or at least have suspected the true state of affairs at the time of operation.

Here, then, was a case that defied accurate preoperative diagnosis, eluded diagnosis at time of operation, and so nearly misled us that we were perilously close to informing a distressed husband that his wife had a cancer. A mere familiarity, on my part, with the fact that intestinal endometrial implantation is a fairly common process might have protected me against all of these pitfalls.

There is no occasion to furnish a detailed description of the microscopic sections; but, as a matter of record, five sections are reproduced.

Sampson³ has described the lesion in his paper on "Intestinal Adenoma of the Endometrial Type," and he must be credited with the honor of having recognized first the possibility of the escape of endometrium from the fimbriated ends of the fallopian tubes. He has shown, conclusively, it seems, that the endometrial particles thus escaping usually tend to drop on the ovaries and to develop as implants, growing into the ovarian tissue, which acts as a brood depot. During the process of growth of the endometrial implants small cysts develop. These cysts usually contain old blood (hence called chocolate cysts) because the endometrial implant functions just as does the normal

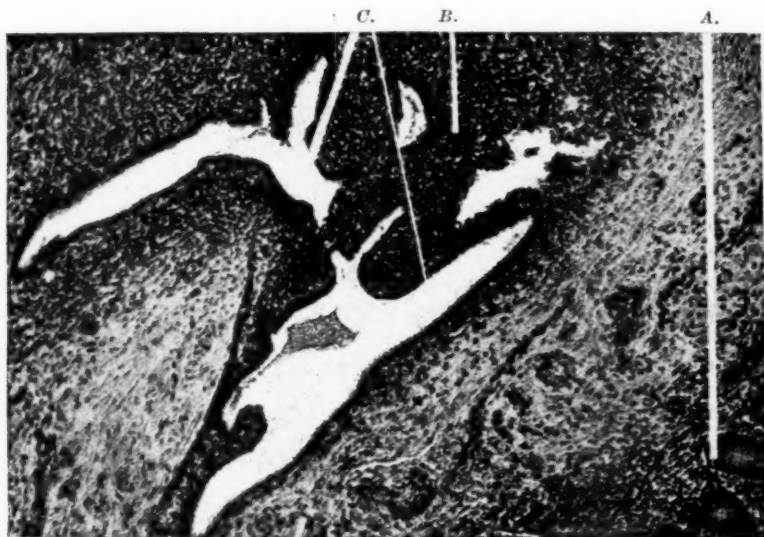


Fig. 5.—Well developed endometrial tissue just beneath lumen of appendix. Note the ciliated epithelium lining the glands. A, Lumen of appendix; B, stroma; C, uterine gland.

uterine endometrium. The chocolate cysts tend to rupture and to discharge their endometrial lining into the peritoneal cavity. Finding a new site on the serosa of the intestinal tract, the implants take on new growth and develop into the intestinal adenomas of endometrial type. It is possible for intestinal implantation to occur without the intervening agency of the ovary.

It is not without interest to note that Sampson published his first studies in 1921,³ and then followed them up with papers in 1922.⁴ In 1925 he published his most recent studies of carcinoma originating in endometrial implants.⁵ As early as 1899, Russel described the presence of endometrial tissue in the ovary, and in 1905 Pick lent emphasis to the subject by publishing four cases of his own. The German gynecol-

ogists and pathologists then worked over the field very thoroughly with the result that there were established two theories to explain the phenomenon of endometrial growth in the ovary. One school contended that anomalies in muellerian duct development were responsible for the condition, and the other school believed that the germinal epithelium of the ovary had the power to produce endometrium postnatally. The German investigators have rather unyieldingly refused to accept Sampson's views, but there seems to be a tendency now to veer toward Sampson's theory. For instance, Lauche⁶ in a very recent article reverses himself and says, "We may agree with Sampson that all intraperitoneally situated growths that resemble uterine mucosa and that are not real tumors (adenomyomata) may be regarded as implantations of uterine mucosa." Very recently, Halban⁷ advanced a new theory to the effect that the uterine mucosa elements burrow into the lymphatic spaces and are thence distributed intraperitoneally by the lymph route.

In view of the fact that this report represents only the sixth recorded case of endometrial adenoma of the appendix, it is not possible to construct a very clear-cut picture of the disease, to serve as a guide in recognizing it. Judging, however, from the admirably detailed study by Sampson,⁸ it seems safe to assume that, by being on guard, we shall recognize it in many more instances than we have in the past.

The treatment of endometrial implants in the appendix is complicated by the fact that Sampson believes that in cases of intestinal endometrial adenomas, the uterus, tubes and ovaries should be removed when they show evidences of being the site of coincidental implants. He leaves the intestinal lesions untouched, because symptoms due to the growth of the implants cease after the menopause. The wise course, it seems to me, in cases of the involvement of the appendix, with only insignificant lesions in the genital tract, would be to remove the appendix and to treat the demonstrable genital lesions as conservatively as possible.

CONCLUSIONS

1. Endometrial adenoma of the appendix is probably a more common disease than the few recorded cases warrant.
2. It may so closely resemble carcinoma, microscopically and clinically, that it is imperative for surgeons to learn to recognize the lesion.
3. The characteristic features of the disease are: (1) its exclusive occurrence in women; (2) the age incidence of from the thirtieth year to the age of the menopause; (3) the accompanying lesions of genital tract, rectum, sigmoid and higher intestinal tract; (4) the history of sterility, acquired painful menstruation, symptoms of chronic intestinal obstruction and acute exacerbation of pain at the menstrual periods, and (5) the tendency to spontaneous regression after the menopause.

4. Microscopically and macroscopically, the distinguishing morphologic features of the disease cannot be mistaken if one has familiarized himself with the appearance of them.

5. Treatment consists in removal of the appendix, extirpation of implantation foci in the genital tract (if necessary panhysterectomy).

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NOTE: Since the manuscript of this paper was submitted Outerbridge has reported four cases of possible endometriosis of the appendix (*AM. JOUR. OF OBST. AND GYNEC.*, October, 1925, p. 545) and Sampson has urged the similarity of channels involved in the dissemination both of cancer and endometrial tissue. (*Ibid.*, p. 649.)

EXTRAMEATAL PROLAPSE OF THE URETHRA, WITH THE REPORT OF A CASE HAVING AN ACUTE ONSET*

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THE terms "prolapse of the urethra" and "urethrocele" have been used interchangeably by various authors in referring to two quite different lesions. Literally, each may imply "the falling down or sinking of the part or viscus."¹ Herniation of the urethral walls through a rent in the urethrovaginal fascia frequently occurs as a result of the traumatism of labor, and although in a recent article Watkins² alludes to this condition as a prolapse of the urethra, it would seem more logical to speak of it as a supravaginal urethrocele. Dorland interprets the word urethrocele to mean either a diverticulum of the urethral body encroaching upon the vaginal canal or a prolapse of the urethra through the meatus urinarius. Extrusion of the mucous membrane through the meatus is more unusual than the supravaginal sagging, and to distinguish the one from the other I would suggest that the circumferential protrusion be designated as an extrameatal prolapse. The confusion in nomenclature may henceforth be avoided by qualifying the urethrocele or prolapse by the words "supravaginal" or "extrameatal."

The supravaginal displacement appears beneath the symphysis, involves all the walls of the canal, and is the prototype of a cystocele.

*Read before the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, Hot Springs, Va., September 16 to 18, 1925.

Since it occurs so often after labor, either because of trauma, malnutrition, or chronic cystitis with residual urine, the etiologic factors concerned in its production are evident. On the other hand, when the urethral mucosa becomes everted and rolls out through the meatus, there is increased mobility of the inner tube (mucous membrane) only, and as this condition is seen occasionally in little girls and nulliparous women, its development cannot be attributed to the same causative alterations. Stöckel³ believes that the detachment of the mucosa may be due to atrophy of the underlying stroma. I have observed a number of cases of extrameatal prolapse in which a concomitant hypertrophy of the labia minora was noted, suggesting the likelihood of masturbation

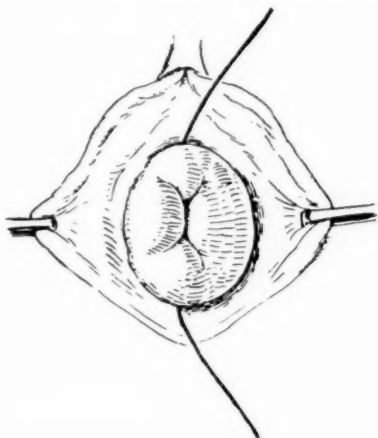


Fig. 1.

Fig. 1.—The silk transfixion suture passed through the base of the tumor and urethral lumen, immediately in front of the meatus.

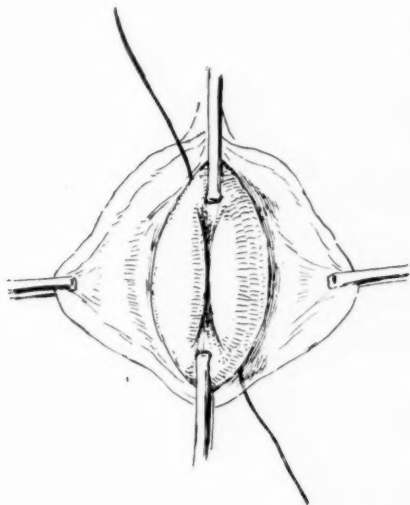


Fig. 2.

Fig. 2.—Stretching the urethral canal to make sure that the transfixion suture is properly placed.

as an exciting cause. In most instances the extrusion of the mucous membrane progresses insidiously, and the lesion is chronic when first seen. Acute cases, with strangulation of the prolapsed tissue at the meatus, are comparatively rare. The histopathology of a recent specimen arouses the suspicion that in cases with acute onset the pathogenesis may be somewhat analogous to that of hemorrhoids.

N. S., a spinster, fifty-four years old, a domestic by occupation, residing in another city, was seized with a sharp pain in the region of the vulva at 2 P.M. on May 9th, 1925. The attack was not preceded by undue physical exertion, although constipation had been obstinate for many years. There was extreme urgency and

increased frequency of urination, but only a few drops of urine were voided at each effort. On admission to the hospital at 5 P.M., examination disclosed the presence of a large tumor, projecting 52 mm. from the vulva and surrounded by the labia. It was 45 mm. in diameter at its widest part. The livid color, delicate surface, and the presence of a slit in its center through which a catheter could be passed into the bladder, identified the tumor as the urethral mucosa extruded through the meatus. The hymen was intact.

In the hope of reducing the size of the congested mass so that replacement might be attempted, the patient was put to bed; hot, wet compresses were applied constantly; the diet was restricted to fluids, and the bowels were cleared with enemata. These remedial measures neither afforded the patient symptomatic relief nor lessened the tumefaction to the slightest degree. In fact, the surface color gradually became darker, indicating necrosis.

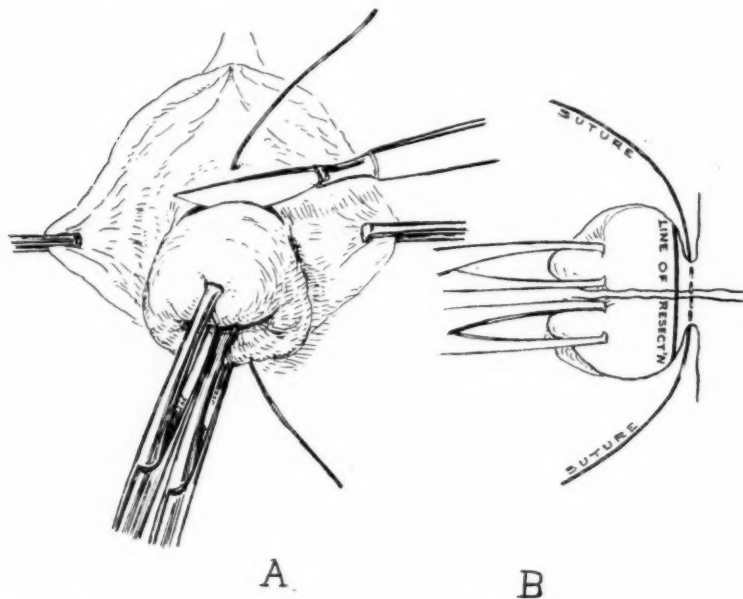


Fig. 3.—Resection of the prolapsed tissue. A, Shows the incision begun on the anterior surface; B, the line of resection.

On May 12 the tumor was resected, following the technic recommended by Ashton.⁴ The prolapsed mucous membrane was grasped with Allis clamps and drawn forward. A silk ligature was then passed through the upper edge of the external meatus, directly across the canal, emerging at the lower margin of the urethral opening (Fig. 1). The orifice was stretched open by means of the clamps, to make sure that the silk thread traversed the lumen of the urethra (Fig. 2). The redundant tissue was cut away in front of the ligature (Figs. 3 and 4), and the transfixion suture pulled out of the urethral canal with forceps. This loop was cut (Fig. 5), leaving two sutures which controlled the edges of the wound at opposite points and prevented retraction of the mucosa (Fig. 6). The circumference of the external meatus was then sutured with interrupted catgut stitches, approximating the severed mucous membrane and the margin of the urethral opening (Fig. 7). A Pezzer catheter drained the bladder for forty-eight hours. Although the patient was permitted to void thereafter, 2 or 3 ounces of residual urine were recovered by catheterization after spontaneous urination for several days.

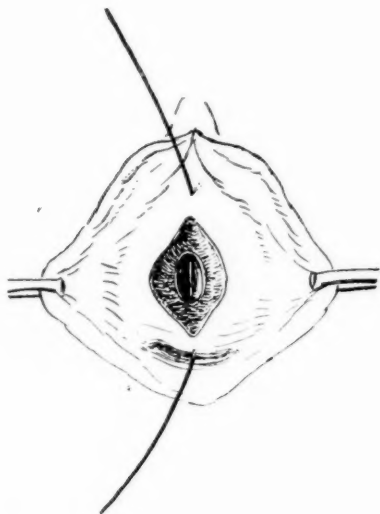


Fig. 4.

Fig. 4.—The redundant tissue cut away.

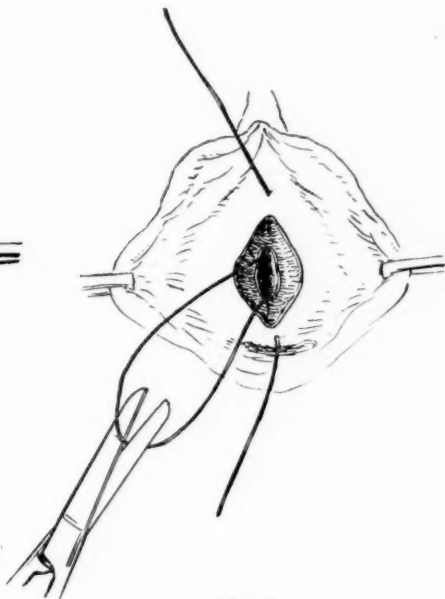


Fig. 5.

Fig. 5.—The transfixion suture pulled out of the urethral canal and divided.

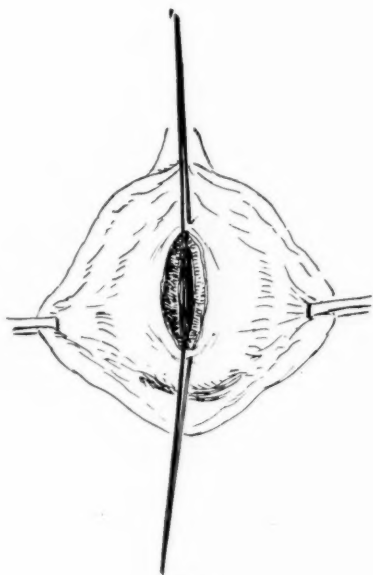


Fig. 6.

Fig. 6.—Preventing retraction of the severed mucous membrane by means of the two loops of silk.

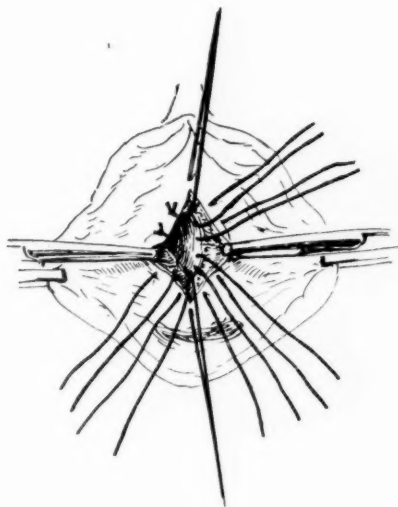


Fig. 7.

Fig. 7.—Suturing the circumference of the meatus with interrupted chromic catgut stitches.

Hexamethylenamine and sodium benzoate were prescribed for one week. Recovery was uneventful and the patient free from symptoms when she left the hospital on the twelfth day.

Pathologic Report.—The specimen is an oval piece of tissue measuring 20 x 18 x 17 mm. On gross examination, it is seen to be extensively hemorrhagic, and shows marked thrombosis of the blood vessels.

On one edge, the sections show transitional epithelium, with superimposed red blood cells, polynuclear leucocytes, and desquamated epithelial cells. Most of the surface, however, is denuded of epithelium. In the center of the sections there is a slit, lined by several layers of transitional epithelium, evidently the urethral ostium. Beneath this epithelial lining there are three glandular structures on one margin, apparently Skene's glands. The underlying stroma is extremely edematous, the fibrous connective tissue being heavily infiltrated with polynuclear leucocytes, lymphocytes, plasma cells, large mononuclear wandering cells, and extravasated red

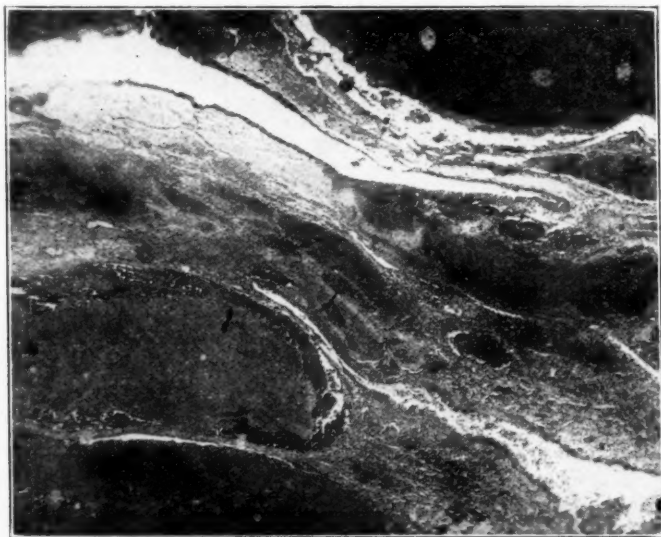


Fig. 8.—Cross section of the urethral tumor, showing the tremendously engorged blood vessels containing organized thrombi.

blood cells. The most striking feature of the microscopic picture is the enormous number of blood vessels, which resemble sinuses and are separated by narrow strands of connective tissue. They all show engorgement and beginning organization of thrombi. In some portions of these sinuses the epithelial lining is clearly recognizable, in some it is proliferated, and in others it is completely destroyed and the wall is infiltrated with polynuclear leucocytes. The histologic picture is quite similar to that of hemorrhoids (Fig. 8).

Comment.—In this case no causative factor to account for the sudden extrameatal urethral prolapse other than chronic constipation could be discovered. At the same time, it is interesting to note that the patient did not suffer from hemorrhoids.

The most important detail of the operative treatment of prolapse of the urethra is the placing of the transfixion suture, to prevent retraction of the mucosa after the tumor is resected.

An in-dwelling catheter helps to maintain the patency of the urethral canal during the first few postoperative days, and the bladder should be catheterized occasionally thereafter. Otherwise residual urine may accumulate.

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(For discussion see page 522.)

WEIGHT ESTIMATES DURING PREGNANCY AND THE PUERPERIUM*

BY WILLIAM KERWIN, M.D., F.A.C.S., ST. LOUIS, MO.

OBSERVING the weight gain in the pregnant woman should no longer be a question for discussion among obstetricians, as its value has been definitely established by the work of several recent observers. The state of health coincides fairly accurately with the weight in the nonpregnant state, and in pregnancy this holds more or less true, although variations within physiologic limits occur. The patient's attitude towards prenatal care is determined by the interest which the obstetrician shows in her general state of health, and there is no better way to stimulate this interest than to observe, at regular intervals, the weight gain the patient is making.

In the nonpregnant state, a woman gives considerable thought to her physique, but when pregnant, she slumps to a considerable degree and awakes with a much altered postnatal figure. The sagging breast, wrinkled bosom, bulging hips, pendulous abdomen, etc., are conditions to which pregnancy fat makes a liberal contribution. A too rapid gain in the late months may be a factor in the toxemia of pregnancy. Among those who have made a study of weights during pregnancy are Gassner, Zangemeister, Lorenzen, Nebel, Baumm, Heil, Kruger, Momm, Kemper, Davis, Hannah, Smith, and Randall.

Gassner was interested in showing that gain in weight throughout the terminal months of pregnancy is within physiologic limits. Zangemeister found that the weight increases progressively from the twenty-seventh week to the end of pregnancy, and states that "the average increase from the twenty-seventh to the fortieth week is 5.55 kilograms, 405 grams per week or 55 grams per day. The greatest weight is attained three days previous to delivery, although some patients make this weight at an early date. During the last few days of pregnancy there is a decided decrease in weight in about 98 per cent of the cases, and this foretells the

*Read at a meeting of the Gynecological Society, St. Louis, Mo., December 11, 1925.

onset of labor. Multipara and primipara increase equally and the terminal fall is equal. The increase in heavy women is more than in light women. The increase and decrease depend on many factors; such as, age, size of fetus, etc; the increase is not only caused by the growth of the ovum, but the organism as such increases."

The decrease in weight is caused by processes in pregnancy and in the organism, and not alone by the loss of the ovum and the cause has not been determined. An increase in diuresis has been observed at this time. Intrauterine death of the fetus causes decrease in weight.

Lorenzen found the average weight gain after the thirty-first week to be 69 gm. per day. In the last four weeks the increase is greater than during any previous month. Maximum weight is attained two days before delivery. He states, "there are three types at the end of pregnancy: (1) Body weight increases up to the end of pregnancy without any terminal decrease. (2) Weight attains greatest height shortly before birth and decreases, (a) continuously up to delivery or (b) remains same. (3) Weight increases up to three days previous to delivery and then falls decidedly."

Fat women increase more than lean. Multiparae increase more than primiparae. Davis gives an average weight loss of fifteen pounds following delivery. He considers a weight gain of seven and a half pounds per month during the last three months as excessive, and the weight should be controlled. A rapid weight gain is a forerunner of eclampsia.

Hannah diets patients to control weight gain, because he considers it dangerous to mother and child when weight gain is excessive. Smith concludes, after an investigation of 3721 records from London Hospitals and 2441 from Dublin Hospitals, that a state of bad nutrition of the mother at the time of labor, due to insufficient foods greatly increases the per cent of stillbirths and premature births; greatly decreases the average weight of full-term babies at birth; definitely increases the postnatal infantile mortality; has little if any effect on the progress of babies during the first eight or ten days of life and possibly increases the death rate of babies during the first three days of life. A state of good nutrition, on the other hand, considerably increases the average weight of full-term babies and also the percentage of mothers able to suckle during the first eight or ten days.

The figures on the whole suggest that average nutrition of the mother is the most favorable condition.

Randall found that a too rapid gain in weight during the last two months of pregnancy occurred in a series of twelve patients with toxemia.

It has interested us to watch the increase in weight during the different trimesters and the decrease that takes place during the first two weeks following delivery and the decrease that occurs during the normal puerperium. Several hundred records of cases coming to the Cass Avenue Prenatal Clinic were reviewed to obtain the following data: The average gain from the end of twelve weeks to the end of twenty-four weeks in 260 cases was eight and one-half pounds. The average gain from the twenty-fourth week to the end of pregnancy in 127 cases was seven and one-half pounds. The average gain from the third month of pregnancy to the end in 147 cases was sixteen and one-half pounds. The average loss during the six weeks following delivery in 152 cases was sixteen and one-third pounds.

These weights were taken from records of patients of all nationalities, most of whom belong to the laboring class. The average loss in weight

during the two weeks following delivery in 73 hospital cases of the more leisure class was twenty pounds. These weights were taken at St. Mary's Hospital at the onset of labor and again two weeks later when the patient was discharged. The figures indicate that the loss for the first two weeks following delivery is greater than during the six weeks following delivery; in other words, the patient regains some of the weight loss which must be attributed to the inactivity of the body while at rest in bed. There are no figures to cover the change in weight during the lactation period, but this, needless to say, would be greatly influenced by the diet, the activity, and the environment of the patient and the vigor of the child.

The greatest weight gain from the twelfth to the twenty-fourth week was twenty pounds in a patient weighing 139 pounds at the end of the twelfth week, attaining a weight of 159 pounds at the end of twenty-four weeks. The smallest gain during that period was one pound in a patient weighing 193 pounds at the end of twelve weeks and 194 pounds at the end of twenty-four weeks. This patient was on a diet low in fats and sugars. In the series between the twenty-fourth week and the end of pregnancy the greatest weight gain was 26 pounds in a patient who weighed 152 pounds at the end of twenty-four weeks, and 178 at the end of pregnancy. One patient in this series, weighing 230 pounds at the end of six months, weighed 231 pounds at the end of pregnancy. This patient was subjected to a diet low in fats and sugars. The greatest gain from the twelfth week to the end of pregnancy was 38 pounds in a patient weighing 142 pounds at twelve weeks and 180 pounds at the end. The smallest gain during that period was six pounds in a patient weighing 109 pounds at twelve weeks and 115 pounds at the end. When the weight was excessive for the height of the patient, diet was instituted with the hope of controlling the gain as far as possible. In private practice with the patient under better control this could be accomplished in practically all cases. It was apparent that the patient felt decidedly better if the weight gain was kept low, providing the initial weight was above par.

The greatest loss during the first two weeks following delivery was 36 pounds in a patient who weighed 176 pounds at the end of labor and 140 pounds two weeks later. The smallest loss was 7 pounds in a patient weighing 125 pounds at the onset of labor and 118 pounds two weeks later. One patient weighing 182 pounds at the onset, however, weighed 174 pounds two weeks later, a loss of 8 pounds, so that the weight of the body and the size of the ovum do not necessarily determine the amount of weight loss. During six weeks of the puerperium the greatest loss was 31 pounds, in a patient weighing 183 pounds at the end of pregnancy and 152 pounds six weeks later. One patient weighed 113 pounds at the end of pregnancy and weighed the same six weeks later,

while another weighing 168 pounds weighed 166 pounds at the end of six weeks.

It would be rather difficult to chart the individual cases showing small losses and great losses, but the series show that certain facts are apparently true, namely: That the loss in weight during the puerperium is not solely influenced by the weight of the ovum, by lactation, or by the weight of the body at the onset of labor. It therefore must be a combination of these factors, with environment, diet, and exercise playing important rôles.

The gain in weight is not effected in all cases by the growth of the ovum, as it can be definitely controlled through diet, exercise, etc. Edema no doubt plays a very important rôle. Needless to say, the patient who has lost considerable weight during the early months as a result of nausea and vomiting, will regain weight rapidly after these conditions have passed, and this she should be permitted to do. It is not advisable so to restrict the diet that the fetus is deprived of ingredients necessary for its development, although there is some doubt as to whether these products are procured through the diet of the mother, or can be obtained in sufficient quantity from the mother's tissues. Figures compiled during the starvation period of the war suggest that the fetus is capable of normal development regardless of the mother's diet.

A summary of the above facts and the work of others force the following conclusions:

1. Obesity is pathologic in pregnancy as well as in the nonpregnant state.
2. It can and should be controlled through diet and exercise.
3. Excessive weight gain is detrimental to both mother and child.
4. The weight gain is about equal in the second and in the third trimesters. (The rapid gain in the second trimester is probably due to the fact that the patient enters the second trimester with a weight below normal, brought about by the disturbance in digestion which frequently exists in the first trimester.)
5. The weight loss for the puerperium about equals the weight gain made during pregnancy.
6. The greatest loss occurs during the lying-in period, and this loss is not due solely to the loss of the ovum.
7. More consideration should be given to the future health and physique of the pregnant woman. Improvement in these conditions can be obtained through the control of pregnancy fat.

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LISTER BUILDING.

INJURIES OF THE INFANT DURING DELIVERY*

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IN ANALYZING the theme assigned to me, I was carried in retrospect to the winter of 1907. It was my good fortune to spend several hours of each day with Dr. Störk, one of the pathologists in the Allgemeines Krankenhaus, in Vienna. Here it was not uncommon to witness from ten to fifteen or more autopsies almost every day. Adult autopsy material was always abundant, it being the rule that all patients dying in the institution be subject to postmortem investigation. Daily I observed large numbers of bodies of newborn babies in the morbid anatomy room, but in these, routine postmortem studies were not made. Naturally, I was led to speculate as to the cause of fetal death. The question arose as to whether all were inevitable and whether some, at least, were not preventable.

In recent years, the question of fetal injury and fetal death has been receiving more and more the long deferred attention it justly deserves. Noteworthy strides have been made in maternity work, but the high plane on which practical obstetrics should stand has not been attained. In this country, there is something woefully wrong, since from the standpoint of obstetric mortality, we stand fourteenth in the sixteen leading nations of the world. In New York City, according to Polak, "one baby out of every twenty-one is born dead and one out of twenty-six dies before it is one month old, while one mother in every two hundred and fifty deliveries dies from infection or as an indirect cause of it." This author further claims that more than 61 per cent of all gynecologic surgery is a result of poor obstetric practice. Dr. Barton Cooke Hirst, five years ago, in a paper entitled: "The Obstetrical Department of a Modern Medical School," drew attention to the defects in the teaching and practice of obstetrics in America. In Pennsylvania, the maternal mortality has not changed in the past seventeen years. The mortality was 6.1 per cent per thousand in 1906, and it was precisely the same in 1923. Twelve hundred and fifty-one mothers died in confinement in 1922, and the toll in 1923 was 1,373.

*Read at a meeting of the Philadelphia Obstetrical Society, November 10, 1925.

It is impossible to compute the vast multitude of women rendered physically incompetent or at least partially handicapped by complications arising in both pregnancy and labor. *I believe that no other function performed by the human organism exacts such an enormous penance in morbidity and mortality as does pregnancy with its culmination in labor.* It is said to stand second to tuberculosis as a cause of death in women between the ages of fifteen and forty-five.

When the true status of obstetrics as a major surgical specialty is accorded the place it should rightfully own, the illusive term "physiologic process" will no longer hold as a common medical phrase, since in so many instances pregnancy, with its consummation in childbirth, becomes a pathologic problem.

It may not be prudent to deal in prophecy, but it seems reasonably safe to assert that 50 per cent or more prospective mothers will inevitably suffer with some type of physical incompetency, often of a most subtle form. With this knowledge gradually becoming ingrained in the mind of the profession, expectant mothers will receive the long deferred antepartum, intrapartum, and postpartum care their condition demands.

Statistics disclose that from 3 to 5 per cent of all babies die during delivery. It is estimated, according to the United States Department of Labor, Children's Bureau, that in this country the annual death rate of babies less than one year old, including stillbirths, totals 300,000. It is authoritatively stated that at least 50 per cent of these deaths (150,000) are wholly unnecessary. This report further shows that slightly more than 42 per cent of the babies dying under one year of age did not live to complete the first month of life. Of the 42 per cent mentioned, seven-tenths died as a result of antenatal conditions or from accident or injury sustained at the time of birth. Of the babies who lived less than one week, 83 per cent died of the causes mentioned, and of those that lived less than one day, the causes named were responsible in 94 per cent of cases.

While statistics provide fairly reliable data respecting fetal death in its relation to pregnancy and parturition, statistics cannot compute, nor can the human mind fully comprehend the vast army of infants left physically disorganized or mentally crippled; herein lies the dark tragedy of childbirth.

Fortunately, in recent years, this catastrophe affecting the human family is receiving more and more attention. Ehrenfest says: "Wider interest in the causation and prevention of parturitional injuries of the infant, while of relatively recent date, is growing rapidly and is obvious to anyone conversant with modern obstetrical literature." Again, "Today we are facing the surprising fact that in at least 40 per cent of the autopsies properly performed on stillborn infants and

those dying within the first few days after birth, some sort of intracranial lesion is found."

In this connection, it may be of interest to cite the status of obstetrics, especially as regards the welfare of the child, in countries other than our own. A relatively high puerperal infant morbidity and infant mortality is not restricted to any nation on earth.

In England, according to Holland, infant mortality has been reduced one-half in the past twenty-two years, or from 154 per thousand in 1900 to 77 per thousand in 1922. The number of deaths occurring in the first four weeks postpartum, however (neonatal mortality), has shown only a slight decline. Holland points out that nearly one-half of the deaths "occurring" during the first year of life "occur" during the first month and nearly one-half of these "occur" during the first week. It has been shown clearly by Holland, that the large proportion of these are due to obstetric accidents or obstetric injuries.

An analysis of the possible injuries to which the infant is exposed during delivery discloses that damage may be inflicted anywhere from the cutaneous envelope (the omnipresent caput succedaneum) to the mucous lining, including in the area between the bony architecture and the parenchymatous organs as well.

The most serious damage, both in its immediate and remote results, is that sustained by the cerebrospinal system.

Schwartz, in a series of investigations on newborn infants asserts that the pathologic conditions arising in the first month of neonatal life are dominated by injuries sustained by the brain during labor. Fischer, from postmortem studies, found that 10 per cent of the deaths occurring in the newborn during the first four weeks postpartum, were the result of cerebral damage inflicted at the time of birth.

Before considering this phase of parturitional damage, I wish to direct attention to the possible trauma inflicted to the buccal mucous membrane by the method customarily employed in removing secretion from the baby's mouth. Manual removal with the gauze-enveloped finger must inevitably traumatize, more or less, the mucous membrane. With the mucosa broken, infection is certainly possible, since it is well known that the mother's milk contains a wide variety of bacteria, including staphylococci, colon bacilli, and, in as high as 49 per cent of cases, streptococci. Fortunately, only 2 per cent of the latter are found hemolytic. Furthermore, it is equally well known that shortly after birth myriads of bacteria appear in the baby's mouth. To exclude or minimize the possibility of buccal infection, we have abandoned the usual plan of cleansing the mouth and are now using in the Jefferson Maternity Hospital an electric aspirator, fashioned after the aspirating device commonly used by the laryngologist. This method is on trial, and whether or not it will afford any

safeguard against infection, only a fair test will tell. The method will at least keep traumatizing fingers out of the baby's mouth.

Another condition, though not strictly an injury, yet one which may legitimately be placed in the category of birth accidents, is infection of the stump of the umbilical cord. Some authorities consider such infection responsible for as high as 10 per cent of the mortality of infants less than one month old. What part the constantly soiled silk braid commonly used in ligating the stump plays in acting as a culture medium, one cannot say. It may have an influential rôle and it may not, though the method does not rest upon sound surgical grounds. Recently, we devised a "metallie ligature." This is composed of German silver and it is now used instead of ordinary silk braid. Whether or not it provides the bactericidal power silver is thought by some to possess or any other advantage over the old method, remains for further study alone to reveal. It does exert constant pressure and hemostasis is assured. It does not cut the cord, no tying is required, and it may be used, always resterilized, a great many times. It is inexpensive and may be purchased at a cost not exceeding ten cents.

Passing now to the serious accidents and injuries of parturition, I shall briefly consider those affecting certain nerves, the spinal cord, and the brain. To these special types of birth injury considerable attention has been directed during the past few years.

Trauma, according to Von Reuss, results either from trouble in the genital passage of the mother, or from obstetric maneuvers, either manual or instrumental. In artificial deliveries it is either manual manipulation in breech or transverse presentations (version and extraction) or the obstetric forceps which damage the child. In spontaneous delivery the cause lies chiefly in disproportion between the child and the mother's pelvis, in pelvic deformities, or in malpresentations.

Damage may occur particularly after long labors and also in precipitate labor in which the child is forcibly driven through the pelvic canal. While it is well to recall that almost all forms of injury to the child may arise during spontaneous or normal delivery, the large proportion of injuries occur after difficult manual or instrumental labor. It is of interest to note at this time that accumulated evidence tends to disclose that conditions heretofore regarded as congenital are in reality late expressions of damage sustained during birth, conditions which, in the beginning, did not give rise to prominent symptoms and which were undetected because of indifferent care or lack of knowledge on the part of the obstetrician.

The late recognition of many birth injuries may probably be attributed to the attendant, who regards his obligation discharged when the umbilical cord is tied and dressed. We should not leave the patient with the assumption that our duty ceases with the birth of the

baby. In order to afford every possible safeguard for the child, those born in our department in Jefferson Hospital are placed under the immediate care of a competent pediatrician. This ideal method is not practicable in general work, but it should constitute a routine feature of neonatal work in institutional practice.

NERVE INJURIES

Parturitional nerve injuries are limited almost exclusively to the facial and brachial plexus. These are nearly always the result of complicated labors and usually of artificial deliveries. E. Stransky analyzed 94 case records of birth palsies which he collected from the literature. In these the type of delivery was as follows:

Manual assistance (Extraction, freeing of arm),	50 cases.
Forceps,	31 cases.
Protracted and difficult labor,	27 cases.
Asphyxia,	11 cases.
Spontaneous labor,	2 cases.

While nerve injury may occur in all varieties of presentations, most authorities believe that the Duchenne-Erb type of palsy, which involves the fifth and sixth cervical nerves, is found almost exclusively after breech presentations. This point, however, still seems open to controversy. Ehrenfest assigns direct pressure of a forceps blade as occasionally responsible. More frequently, he states, trauma inflicted in delivering the after-coming head is the causative factor. Respecting the mechanical factors as influential in obstetric paralyses, those upon which responsibility is usually placed are:

1. Direct compression, manual or instrumental.
2. Traction resulting in overstretching.
3. Traction causing plain tearing.
4. Compression or traction followed by blood extravasation or inflammatory disorganization.

Either of these destructive forces may follow the Prague or Mauriceau-Smellie-Veit method of breech extraction. Direct pressure by the tip of one blade of the obstetric forceps is said to be definitely causative in a certain number of cases, but this, according to Stolper (quoted by Von Reuss) is only possible when the forceps are applied to the head in oblique position or when the rules of proper application are not observed or deflection is overlooked. In certain cases serious nerve trauma has resulted from pressure of a hematoma, and even pressure of the umbilical cord may sometimes, though rarely, account for nerve damage in the region of the brachial assembly (Roulland). Pressure of the clavicle on the brachial nerves is said to be a cause in some cases, especially if the arm locks over the head in vertex presentation, and Dr. Burr, of Philadelphia, in 1920, referred to trauma of the cord itself as sometimes causative.

A paper by Gilmour recently appeared, reporting twenty-five cases of brachial birth palsy, of which twenty-three were of the Duchenne-Erb variety. Two were of the general arm variety, but there was no instance of a pure Klumpke type. As to the cause in these cases: all but three of the births were described as long or difficult, though in one case the period of labor was short, only lasting five or six hours. In two, delivery was natural and unassisted. In the rest, chloroform was used to facilitate instrumental or manual delivery. Three infants were said to have been asphyxiated and to have required prolonged resuscitation. The presentation was vertex in sixteen cases; breech in four cases and irregular in type in five cases.

Six forms of brachial plexus damage are described, according to the site and extent of the injury.

1. The most common form is the Duchenne-Erb type, in which the upper part of the plexus is affected. The damage involves the fifth and sixth cervical roots or the trunk formed by their union. Functional disturbance is observed in loss of power in the muscles about the scapula and arm, giving rise to the typical deformity in the arm, forearm, and hand, described sometimes as the "tipping" attitude.

2. Involvement of the eighth cervical and first thoracic nerves or the trunk formed by their fusion is usually described as Klumpke's type. Loss of function occurs in the muscles of the hand and also in the large flexor muscles of the forearm. The second thoracic root is sometimes affected, and, as a result, the muscles supplied by the musculospiral, the extensors of the hand and fingers, are also palsied. In addition, owing to the intimate relationship of the first thoracic to the sympathetic, changes in the oculopupillary reaction occur. Damage of the lower section of the plexus is followed by more extensive and serious paralytic disturbance than injury of the upper section.

3. In certain instances the damage of the plexus is more or less complete, resulting in loss of power of all of the muscles of both the arm and forearm. In this type serious bone lesions, it is claimed, are usually an accompaniment of the primary damage. Posterior subluxation of the humeral head has been pointed out as a cause by Thomas, of Philadelphia, and others.

4. In certain other cases there is a combination of the upper and lower types, with transition from partial to total paralysis.

5. In still other instances damage is more or less isolated and palsy of a single muscle, such as the deltoid or supinator longus, occurs.

6. The damage may involve both sides, resulting in a bilateral palsy, though this is extraordinarily rare.

Paralysis of the Lower Extremity.—Damage of the cord or lower spinal roots, resulting in paralysis of the lower extremities, is exceedingly uncommon. Von Reuss refers to a case of complete paraplegia. It existed from birth and was not associated with loss of sphincter con-

trol, thus indicating an injury involving the spinal roots of the second and fourth lumbar and the first and second sacral segments. Injury was thought to be caused, in this case, by excessive traction during delivery.

Obstetric Facial Paralysis.—From the obstetric standpoint palsy of the muscles supplied by the seventh nerve fall into two groups: those following spontaneous labor and those following manual or instrumental delivery.

In the first group injury is sustained only when there is frank disproportion between the diameters of the fetal head and the maternal pelvis. The trouble is seen chiefly in the various forms of contracted pelvis, especially the flat pelvis, the head presenting transversely, with excessive cranial stress being directed from the sacral promontory, the symphysis, or an abnormal bony prominence. As a rule, the trouble arises after primary cephalic presentations, rarely after breech presentations.

The palsy may result: first, from damage in the central origin (basal) of the nerve; second, from injury of the cortical motor area; and, third, from damage of the peripheral portion of the nerve itself, especially that portion about or just beyond its emergence from the stylomastoid foramen, or of its branches. The palsy, therefore, may be the result of intra- or extracranial injury.

The third type of damage is by far the most common (this applies to the second group), resulting in most instances from direct pressure of a forceps blade. Some cases, probably a relatively large number, result from violent edema or a large blood collection following forceps trauma. At any rate, it is estimated that at least 10 per cent of the facial birth palsies follow difficult forceps delivery, and only occasionally is palsy observed after spontaneous labor.

The incomplete nature of the paralysis and the fact that in most instances the damage is not permanent is explained on the basis, first, that severe compression is not made on the trunk itself but on its branches, especially those coursing through the soft parotid gland; and, second, that damage of a temporary nature only is, therefore, sustained.

Von Reuss, whose work has been drawn upon constantly in the preparation of this paper, also directs attention to the temporary and incomplete nature of obstetric facial paralysis, and, owing to this feature of the disorder, he prefers the term "paresis" instead of "paralysis."

Intracranial injury of the nerve may be suspected if the characteristic signs of the facial palsy are associated with evidences of hypoglossal paralysis or a simultaneous palsy of the third nerve with ptosis of the eyelid.

Facial nerve palsies, like those involving the brachial plexus, are nearly always unilateral. Bilateral palsy is exceptional.

Since it is not possible to determine accurately the site and extent of injuries resulting in paralysis without postmortem investigation, we are naturally led to the study of lesions resulting in death.

One of the most noteworthy monographs on this phase of birth injury has been contributed by Eardley Holland, of London, England. This work was taken up under the auspices of the Local Government Board of London. It was begun in March, 1914, and the report was presented in March, 1922. It is based on the most painstaking autopsy studies of the bodies of three hundred newborn babies of viable age.

The examination was undertaken to determine the cause of death in "stillbirths."

In this report it is pointed out that death may occur at three periods:

A. Antenatal (when the fetus is usually macerated).

B. Intranatal, (during labor).

C. Postnatal, (when fetal heart beats at birth but respiration is never established).

The deaths were classified as accurately as possible, according to the primary causes, as follows:

1. Maternal states, such as syphilis and toxemias.

2. Complications of labor, such deformed pelvis and placenta previa.

3. Placenta states, such as retroplacental hemorrhage.

4. Fetal states, such as prematurity and deformities.

Among the actual causes of death, reference was made to the two conditions which were considered of special interest, namely: syphilis and excessive cranial stress; the first, because of its low incidence, and the second, because of its unexpected importance. By most writers syphilis is regarded as the most common cause of stillbirths, but, according to Holland's report, only a relatively small percentage can be attributed to this disease. His investigations respecting this feature of the studies were most complete, yet among the three hundred fetuses examined there were only forty-two cases of proved syphilis and six of probable syphilis, or 16 per cent in all. Fourteen cases were classed as possible syphilis, but in these there was no evidence of the disease in the fetus or placenta. The observations made with respect to excessive cranial stress, defined "as a compound compressive stress, roughly regarded as consisting of two elements, first, a general compression of the whole head and, second, a simple longitudinal compression by opposite forces, acting at the ends of the long diameter of the pelvis," and their bearing upon the use of forceps and the conduct of breech deliveries are exceedingly valuable and suggestive.

The effect of cranial stress upon the brain and membranes is discussed in detail, and many interesting theories regarding the effect of molding upon the cranium and its contents are presented. Of 167 fresh fetuses examined, the tentorium cerebelli was found torn in eighty-one (48 per cent); the injury was associated with laceration of the falx cerebri in five cases, and with subdural hemorrhage in all but six.

Of the eighty-one cases, forty-six were delivered by the head and thirty-five by the breech.

Forceps were used in twenty-five of the vertex presentations, the indications being: Contracted pelvis, placenta previa and prolonged second stage. In some of the cases signs of considerable force having been employed were evident. Holland in this connection states: "while the forceps may save many lives it is also responsible for the unnecessary injury and death of many others."

The thirty-five breech deliveries represent 75 per cent of the total number of breech deliveries examined. The frequency with which the tentorium is torn during breech birth is due, in the opinion of Holland, to the haste customarily advised and employed in extracting the after-coming head. He urges a revision of obstetric teaching with respect to this procedure.

From this report it is apparent that more babies were killed by the complications of labor than died during pregnancy or from maternal or placental diseases.

The observations made by Holland regarding the incidence of fetal injury and fetal death in breech deliveries are in accord with those made by Pierson in the Sloan Hospital, New York.

This author reports 142 viable primary breech deliveries, with natal or neonatal death in eighteen, or 12 per cent. He also reports eighty-seven viable version and breech extractions with natal or neonatal death in eighteen, or 26 per cent. As regards the cause of death, Pierson found spinal cord hemorrhage in seventeen, or 47 per cent of the total of thirty-six cases. Fractures of the vertebrae were found in fourteen, or 38 per cent. Intracranial hemorrhage was present in 44 per cent, though this was marked in only 25 per cent.

In an analysis of the spinal fluid of 423 newborn negro babies, Roberts found that sixty, or more than 14 per cent, contained blood. In the sixty babies in whom spinal hemorrhage was found, the trouble was attributed to trauma in fifty-eight and to hemorrhagic disease in two cases.

Sharpe and Maclaire, in a series of noteworthy studies made of 400 newborn babies in whom spinal puncture was performed within twelve to forty-eight hours after birth, found evidence of excessive cranial stress by the presence of blood in the cerebrospinal fluid in from 7 to 13 per cent of the cases.

Spencer, in a study of 130 stillborn children, found intracranial hemorrhage in fifty-three or 40.7 per cent. Twelve of the babies were delivered by forceps, and in all of these hemorrhage was found. Wallich, quoted by Birnbaum, in 143 post-mortem studies of stillborn babies, found intracranial hemorrhage in fifty-eight, and Litzmann, also quoted by Birnbaum, found spinal meningeal hemorrhage in thirty-three of eighty-one autopsies performed on stillborn infants.

Sharpe and Maclaire, in a very recent series of one hundred spinal punctures performed on newborn babies, found blood contamination in six.

Pierson, in studying his series of cases with reference to the nature of delivery, encountered difficulty with the head in 57 per cent; with the arms and shoulders in 25 per cent; with the cervix in 11 per cent, and with the placenta and cord in 28 per cent.

This author points out that trauma alone was the probable cause of death in 56 per cent of the thirty-six cases. Asphyxia, thought to be the most prominent cause of death in breech delivery, was probably accountable in only 5 per cent. Trauma with asphyxia was thought responsible in 39 per cent. Pierson believes that birth injuries and shock following breech delivery cause a greater fetal morbidity and mortality than asphyxia. Accordingly he advises against unnecessary haste in breech extraction and indicates that hasty action, prompted by fear of asphyxia, is not justified. The diagnosis of death from asphyxia in breech deliveries, he claims, is only justified, first when, there is strong clinical evidence of asphyxia but none of injury, and second, when complete autopsy studies show characteristic signs of asphyxia, but none of injury.

In emphasizing the importance of undue haste in breech extraction, he refers to Potter and others who claim that from fifteen to twenty minutes may safely

be allowed to elapse in delivering the after-coming head. Potter has taken as long as twenty-three minutes in performing an extraction without injury to the child. Indeed, this well-known proponent of the operation of version, on more than one occasion, has even with safety delivered the placenta before the child.

From a study of injuries of the infant during delivery, it is observed that many are largely preventable. The means of prevention may be divided into: first, a wider adoption and higher standard of prenatal care and, second, more thorough intranatal training and better practice.

In conclusion, may I again quote from Holland, who says: "Antenatal methods are the strategy and intranatal methods the tactics of obstetrics." "Obstetrics," he states further, "is the Cinderella of medicine and she is only beginning to ascend to a proper position among her sisters."

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VULVOVAGINITIS IN INFANTS AND YOUNG CHILDREN*

BY PHILIP F. WILLIAMS, M.D., PHILADELPHIA, PA.

VULVOVAGINITIS in infants and young children is one of the topics of common interest to the pediatricist and gynecologist. The importance of this problem and the difficulties encountered in solving it have been recognized for many years. Dr. Bedford, in a textbook on diseases of women and children in 1856, remarks concerning this topic, "that the diagnosis merits all the attention of the physician" and again "that often treatment is utterly unavailing."

The term vulvovaginitis is neither accurate nor sufficiently descriptive, for in the mild cases of vulvitis the vagina is rarely, at least markedly, involved; while in the prolonged complicated cases the many lesions to be met are not sufficiently covered. Kahn suggests this term be reserved for localized affections of the vulva and vagina, and that disease of the infant female organism, caused by the gonococcus of Neisser be designated as "gonorrhea puellarum."

There is doubt that a large percentage of the cases are caused by the gonococcus. Many outbreaks, especially of the epidemic type in babies' homes, schools and hospitals, are caused by the ordinary mucous membrane infecting organisms responsible for colds and upper respiratory infections. Masturbation prompted by mechanical irritation of undisturbed secretion about the labia and clitoris causes a certain percentage, and a flagrant disregard of cleanliness is the basic cause in many others. Contamination from the rectum to the delicate tissues anterior must be considered. Weakened resistance in poorly nourished or ill cared for children in the lower grades of society heightens the susceptibility to infection of the genital organs. Dissemination at times arises in birth infections, communal towels, toilets, baths and thermometers.

During the first twenty-four hours of life the vagina is said to be sterile, but by the third day it contains microorganisms. These include the various staphylococci, streptococci; later on the bacillus coli has been found, and in older children intestinal bacteria form about half the organisms present in the vagina. The finding of organisms so constantly in the vaginas of young children might negative the existence of a natural antiseptic function at this age. The vaginal bacillus of Doederlein is said not to appear until puberty; thus the vaginal canal in infancy does not have its later natural protective function.

The gonococcus has been recovered in smears in from 10 to 50 per cent of cases in various series, and in many cases in pure culture. In

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a large group of cases streptococci of intestinal origin, colon bacilli, gram-positive bacilli resembling diphtheroids, and various types of gram-negative cocci form the bulk of the organisms present. Vulvovaginitis is rarely caused by the Klebs-Loeffler bacillus, but has been noted frequently as an extension of the process in such exanthemata as measles and scarlet fever.

There has been considerable discussion and much laboratory work on the identity of the gonococcus of infantile genital infections. Stein and his coworkers did not find any marked differences serologically between gonococci recovered by culture in their series and the various strains of adult gonococci against which the reactions were made. On the other hand Bonarseu, carrying out the reactions of agglutination, precipitation and deviation of complement, using serums from rabbits inoculated with gonococci isolated from female children and adult males against strains of gonococci of different origin, brought to light a difference of behavior of the gonococcus of the adult from that of children. It would seem proved clinically that the gonococcus recovered from the majority of cases of vulvitis in children represents a less virulent type than the gonococcus of adults. Various types of intestinal protozoa, pin- or seat-worms, or trichomonas, have been regarded as the original source of infection or inflammation of the vulva, the rubbing and scratching consequent to the mechanical irritation excited by their presence opening a fair field for the propagation and effect of the skin surface or rectal bacteria. Possibly in some of the nonspecific cases an examination of the feces may explain the long continuance of the condition under otherwise correct treatment.

As a rule the typical case of gonorrheal vulvovaginitis presents the picture of a moderate desquamative erythema of the vulva. The external genitalia and neighboring folds of skin are covered by a thin whitish mucopurulent or purulent discharge. There is at times in older girls an acne-like folliculitis of the labia. Often the inner aspect of the thigh presents a slight dermatitis. In many cases the vagina is affected coincidentally, the soft, thin vaginal epithelium being penetrated easily by the invading cocci, the reddened areas on the vaginal walls being seen easily when the coating of purulent leucorrhea has been swabbed away. Not infrequently the urinary meatus participates in the general inflammatory reaction. Lesions of the cervix, the body of the uterus and the remainder of the internal genital organs are infrequent. Bartholinitis is infrequent. Local suppuration, that is, of the vulva, is not common, but inguinal adenitis with suppuration often occurs. Both German and American observers recognize the frequency with which rectal infection coexists with gonorrheal vulvitis, but an English author, Kidd, in his recent book on gonorrheal conditions in the female does not seem to agree with this finding.

Seomazzoni had the opportunity of making histologic examinations

of the portio vaginalis and cervix of an infant who had suffered with gonorrhea of the genitals, but who had died of diphtheria. The changes in the cervix were similar to those observed in gonorrheal cervicitis of the adult, which explains at once the occasional prolonged resistance of the disease to the most assiduous attempts at treatment. He found typically chronically inflamed glands on the external surface of the portio vaginalis.

With the variety of etiologic factors present and recognized it is not surprising that the casuists have evolved several methods of classifying the inflammatory conditions of the vulva and vagina in children. Possibly the easiest method is to classify the cases as specific, when the gonococcus is recovered in culture or demonstrated in smears, and to classify all others as nonspecific. This latter group would include everything from the simple catarrhal condition of physiologic origin due, in early infancy, to desquamative processes, and later to changes in metabolism, and further the mechanical reactions with their resulting inflammatory changes originated by uncleanness or rectal infestation, and the various auto-infections, micrococcus catarrhalis, etc.

Complications are rarely seen in the internal genital organs. At times infantile gonorrhea may take an ascending course and lead to severe and lasting lesions. What effect such conditions might have upon the later functions of the pelvic organs is speculative. Many cases of otherwise unexplained acquired vaginal atresias may be laid to the adhesions produced by the inflammation of the vagina in this disease. The bladder seems to be but seldom affected. Randal found the cervix definitely infected in a number of intractable cases; some of these presented ectropion of the endocervix. The invasion of the rectum has been noted many times, especially in the epidemic form of the disease. The rectal mucosa may be infected by direct extension or by the use of a common thermometer, irrigating nozzle or other instrument, and may often be the source of the reinfection of the vulva in relapsing cases. The pathologic changes in proctitis are not marked, the rectal mucosa is reddened and covered at times with a thin seropurulent exudate in which the gonococcus may be demonstrated. Byfield and others have pointed out a rectal infection in male children as a source of origin of outbreaks in infant wards. Gonorrheal arthritis may follow vulvovaginitis in infants and children. Holt states that a pyemic arthritis in a young infant is more frequently due to the gonococcus than to any other organism. Ophthalmia and endocarditis are rare complications of vulvovaginitis.

Relapses and second attacks are extremely frequent. These may be the result of insufficient treatment or to reinfection from the original source. Thus one uncured patient in an institution may be the source of a second attack among cured patients, or a cervical or rectal gonorrhea may persist and cause succeeding attacks of vulvovaginitis. In

many cases relapses occur more than once. The criteria of cure vary so greatly that the term relapse would have to be used guardedly in some instances. Gonorrhea of the rectum takes longer to cure, but relapses of gonorrheal proctitis are said to occur comparatively rarely.

The diagnosis of gonorrheal vulvovaginitis rests essentially upon the demonstration in the stained smear preparation of the diplococcus of Neisser. Material for smears should be obtained by means of a wire loop. In the opinion of Stein, cultures are unnecessary, as in his series positive cultures were found in only 50 per cent of cases presenting positive smear preparations. In some instances it has been found advisable to stain the sediment obtained by vaginal irrigation to arrive at a positive diagnosis. Smears from the cervix may be obtained through a small (No. 26) urethroscope. The uncertain value of the complement-fixation test in gonorrheal conditions in adults has probably led to its not being used generally in juvenile gonorrhea.

As a general statement the prognosis of infantile vulvovaginitis is regarded as favorable. The duration of the disease should be relatively short, provided that the causative factor is not continuously active or that the greater irritation of too active treatment is not responsible for the continuance of the disease. The basic principle in treatment is cleanliness, ordinary soap and water cleanliness. This in itself will effect a cure in a large proportion of the simple catarrhal, mechanically produced types resulting from dirt irritations, and non-specific bacterial cases. Combined with such simple hygienic therapy may be added soothing dusting powders. In some instances tonic treatment may be added. In cases of oxyuriasis the proper helminthic must be added. In the specific cases, or in the nonspecific cases resisting treatment, local antiseptic measures are in vogue. The medicaments used are many. The various silver salts, especially the colloidal silver preparations, various dyes and other chemicals have been advocated for use locally by applications, irrigations, douches or by suppositories or bougies, and by injection in pastes or ointments. The difficulty of treating easily terrified young children makes the actual carrying out of almost any form of treatment not an easy matter.

Gellhorn and Stein recommend the use of silver nitrate and mercurochrome, respectively, in a 1 per cent strength in an ointment base consisting of equal parts of lanolin and white vaseline. This is injected into the vagina by means of a simple glass syringe to which is attached a small rubber tube. The vagina is filled with the ointment, and the excess is allowed to spread over the vulva. The injections are made daily. Stein reports the gonorrheal patients are cured in ten weeks, the suspicious cases in six weeks, and the nonspecific cases in five weeks by this method, and the follow-up work demonstrates its efficiency, there being no recurrence in twenty cases after a year.

If the condition resists simple hygienic therapy or the locally applied

chemicals, vaccines should be tried. Indeed the benefits from the use of vaccines are so confidently recommended by many observers that it is a question whether this method should not always be adopted as a specific part of the treatment. Consequently it would be advisable to take a culture, at the time of making the early smear preparations, to obtain a growth of the organism present for an autogenous vaccine. Naturally autogenous vaccines are to be preferred, and for an initial series of injections, the administration of from 25 to 50 million of organisms are recommended to be injected at intervals of from five to seven days for five weeks. In every case in which the gonococcus is found it should be regarded as the primary infecting agent, and in case it is impossible to obtain autogenous vaccines a stock gonococcus vaccine may be used for the class reaction produced. The initial dose for a child of one year of a stock gonococcus vaccine is given as from one to three million organisms. It may be remarked that prolonged local treatment may be injurious, by the constant chemical irritation and by lessening any chance for recovery of the natural defensive resources of the vagina against bacterial invasion.

That any type of gonorrhea is cured is always a difficult conclusion. Therefore it is not surprising that various observers differ greatly in their ideas on this point. The method elaborated upon by Stein seems to be quite practical; that all clinical evidence of the disease must have disappeared; that negative smears be obtained weekly for three weeks, and that no clinical evidence be noticed during a period of observation equal in length to that used in treatment. In stubbornly resistant cases the disappearance of the gonococcus may be determined by using the method of Van Gieson. The method depends upon the irritation produced by a solution of silver nitrate and the examination of the sediment obtained by irrigation twenty-four hours after the silver has been applied.

In conclusion, one might remark upon the questions of hospital practice regarding isolation, observation of new cases, the question of handling outbreaks, as to laundry, etc., but the time allotted is too short to dwell upon these all important points.

(For discussion see page 529.)

DUODENAL ULCER FROM PARTIAL OBSTRUCTION AT THE DUODENOJEJUNAL JUNCTION*

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IN A paper presented to this organization at its thirty-fifth annual meeting in 1922, fifty-four cases of duodenal ulcer from partial obstruction at the duodenojejunal junction that had been relieved by surgical removal of the obstruction were reported in detail. From July, 1922, to July, 1925, surgical intervention at the duodenojejunal junction alone has been done sixty-four times for duodenal ulcer; associated with appendectomy twenty-four times, with appendectomy and cholecystectomy nineteen times, and associated with gastroenterostomy five times. Visible ulcer of the duodenum was demonstrated at the time of operation by transillumination in eighty-four of the one hundred and twelve cases.

Conditions found at operation and thought to be responsible for the partial obstruction and the development of duodenal ulcer were as follows: Definite jejunosocolic bands, 28; veils or light adhesions definitely kinking the jejunum near its origin, 12; irregularities of the opening through the mesocolon, 8; ptosis of duodenum, acute angle at terminal portion, 14; and tuberculous tumor in mesocolon narrowing the opening and making direct pressure upon the terminal portion of the duodenum, 1. More than one of the above conditions were present in 39 cases.

Associated conditions requiring gastroenterostomy included four cases of ulceration extending through the pylorus with definite constriction at the pylorus and one cicatricial constriction of the pylorus and suspected ulcer of the cardia.

The operative procedures employed were as follows: Separations of the jejunosocolic bands, 34 cases; separations of veils or light adhesions, 29; severing part or all of ligament of Treitz, 32; partial resections of one leaf of mesocolon, 4; miscellaneous procedures for mobilization of gut at junction, 46; duodenojejunosomies, 3; plications of lower layer of mesocolon and mobilization of terminal portion of duodenum, 3, and gastroenterostomies, 5 cases.

Thirty-eight of these patients were operated upon more than two years ago and forty-four more than one year ago. Thirty were operated upon during the last fourteen months. While not enough time has elapsed to state that the results are permanent, yet the symptoms have

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returned in only one case, and that patient had gastroenterostomy as well as intervention at the duodenojejunal junction.

Of the fifty-four cases that were included in our previous report, two died from other causes, one had a cholecystectomy performed, and two required reoperation. In the two cases that were reoperated upon, the symptoms were those of pyloric obstruction. But visualization of the duodenum by fluoroscopy after filling it through the Rehfuß tube, demonstrated that the pylorus was not obstructed but that the obstruction had recurred at the duodenojejunal junction with marked dilatation of the duodenum. In both of these cases duodenojejunostomy gave relief.

Visualization of the duodenum by injection of air or warm bismuth solution through the Rehfuß tube is the usual means of arriving at a diagnosis of partial obstruction at the duodenojejunal junction. Another method is to watch the last portion of the test meal when it leaves the stomach until it passes into the jejunum. As long as portions of the stomach contents are being thrown into the duodenum the contents are forced along and there is no appreciable slowing up of the current even though partial obstruction near the terminus is present. But when the duodenal content is small in amount there is not enough bulk to force it through the obstructed portion, and reverse peristalsis occurs. The last portion of the test meal has frequently been observed to make the excursion from the pylorus to the distal end of the duodenum and back. This usually occurs about every twenty minutes and pain is present during the time that reverse peristalsis is active.

CONCLUSIONS

Partial obstructions at the duodenojejunal junction are sometimes the direct cause of duodenal ulcer; they are sometimes the indirect cause, creating conditions favorable for its development. In some appropriate cases removal of these partial obstructions without gastroenterostomy will be sufficient for the cure of the ulcer.

(For discussion see page 523.)

ON A POSSIBLE CAUSE FOR PEMPHIGUS NEONATORUM. A PRELIMINARY REPORT

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IT WAS the writer's good fortune in 1920 to be a house physician at the Chicago Lying-In Hospital, at the time Dr. Fred Falls was conducting his bacteriologic investigations of the cause of so-called "Pemphigus Neonatorum." His conclusions were that the infecting organism was a staphylococcus of low virulency. Some authorities have classified pemphigus neonatorum as one form of the common impetigo contagiosa, although these two conditions differ both in the clinical manifestations and virulence of the organism found in them by cultural methods. During recent epidemics in three of our local hospitals, we were able to confirm Dr. Falls' conclusions from investigations conducted by the Bacteriological Department of Ohio State University. At this time, it was impossible to transmit this infection to the investigator's skin, to produce a lesion by taking material from one lesion and rubbing it into the skin at another site in the same baby, or to inoculate an uninfected baby by direct contact. The hospitals in combating this infection were using all of the standard methods in technic to prevent transmission of infections of all kinds and they were only partially successful. From this work we felt that the organism found in these lesions was probably no more virulent than the organisms which were present in most hospitals, and which probably do not cause any lesion in normal individuals. About this time we were receiving reports that physicians who were conducting cases in patients' homes were also reporting cases of pemphigus. We wondered if the primary etiologic factor in this disease might not be some preliminary irritation of the babies' skin which made it susceptible to this otherwise innocent organism. We, therefore, felt that we should make an effort to discover some agent which was used by both hospitals and men who were reporting cases of this infection on babies delivered in the home.

Going over the possible sources of irritation, the antiseptic solutions came under our scrutiny and we found that all of the institutions were using the commercial liquor cresolis compositus and not the proprietary preparation. There came also to our attention at this time these facts: First, that when these epidemics started in hospitals, the first few cases seemed to have mild lesions which responded readily to treatment, but after the epidemic had continued for some time, the organisms seemed to have become more virulent. Second, that early in the epidemic the

preliminary lesions were located under the mandible, around the umbilicus, in the arm pits, and in the inguinal region where an obstetrician most frequently touches with his hands a baby being delivered, his hands just previously having been dipped in lysol solution. Third, we discovered that one epidemic started a very short time after the hospital had received a new barrel of liquor cresolis compositus. Fourth, about six months ago, when this thought came to mind, one of the three hospitals discontinued the use of liquor cresolis compositus and adopted a proprietary preparation and since that time they have had no cases of skin lesions in any form.

With the foregoing observations in mind, we went to the delivery rooms of five of our local hospitals and secured samples of the antiseptics which they were using. We also secured a sample from the Department of Chemistry of Ohio State University. These six specimens were submitted to the Department of Physiological Chemistry of the Medical College of Ohio State University, and investigated, and the following is a report of these investigations for which we are indebted to J. B. Brown of that Department:

The preparation, liquor cresolis compositus, is essentially a solution of cresol in potassium soaps of the unsaturated fatty acids, the soap being prepared by direct saponification of some oil, such as linseed, with potassium hydroxide, the cresol being added after the saponification is complete. "Lysol" is merely the proprietary name for such a preparation. From the chemical standpoint three causes for the pathologic condition described above have occurred to us.

1. Variations in the cresol, with the presence of irritant impurities, such as phenols or other substances.
2. Variations in the oils used in the preparation of the soaps.
3. Differences in the amount of free alkali in the soaps due to carelessness in preparation or other causes.

Variations in the cresol might be a very plausible cause for the trouble were it merely irritation of the skin, but, if this were so, one would not expect to find infection following the irritation. If enough phenol were left on the skin to cause a blister, it is difficult to see how microorganisms could enter, particularly of the type found there.

It is likewise difficult to see how variations in the soaps, or, more particularly, in the fatty acids in the soaps, would make any appreciable difference, certainly not enough to cause the trouble described.

The principal possibility for difference in actions in the preparations seemed to lie in variations in the free alkali in the soaps. Experimentally, we have had as yet no opportunity to try out the other two possibilities. With respect to the third, however, we have determined the free alkali and the hydrogen-ion concentration of several preparations. One of these was a sample of lysol which came from the hospital which had been free of any lesions since its adoption, as mentioned before. The other five were samples of liquor cresolis compositus, of which the latter four were suspected to have produced the trouble described.

The sources of the six specimens were as follows:

1. Maternity Hospital, Ohio State University, using "lysol" for past six months with no skin lesions since its adoption.
2. Liquor cresolis compositus from the Department of Chemistry, Ohio State University, the product furnished the medical students by the University.

3, 4, 5, 6. From hospitals where epidemics have occurred at intervals during the last few years.

The hydrogen-ion concentration of the lysol and sample No. 2 was 7.5 to 8.0, the high color making more accurate determination impossible by the colorimetric method. That of samples Nos. 3, 4, and 5 was 9.0 to 9.5 or even slightly above that. The results were the same when the indicator was added drop to drop of the sample or whether the sample was highly diluted with water with subsequent possibilities for hydrolysis. The free alkali in the toxic samples, Nos. 3, 4, and 5, was determined as follows: 5 c.c. of the preparation was added to 150 c.c. of water; phenolphthalein was added, and the mixture was titrated with tenth normal sulphuric acid to disappearance of the pink color. Sample No. 3 required 4 c.c.; sample No. 4, 6.5 c.c.; sample No. 5, 3.8 c.c., to bring about this change. As determined in this manner, therefore, the sample No. 3 had a free alkalinity amounting to 0.08 N.; sample No. 4, 0.13 N.; and sample No. 5, 0.07 N. Lysol and sample No. 2 were neutral or possessed no free alkalinity with this procedure. Sample No. 6 turned white when added to water so was not used, as it evidently contained some other agent.

These results are not proof that this free alkalinity is the cause of trouble, but the fact that the lysol with a zero alkalinity has no toxicity and the three preparations with high alkalinity have toxicity suggests to us a possible correlation between the two. The results also show considerable variation in the free alkalinity of different preparations of the liquor.

Sample No. 2 in the above experiment compared favorably with the proprietary preparation, which proves that liquor cresolis compositus can be made without large quantities of free alkali being retained in the solution. The writer believes that preparations with as much free alkali as reported in specimens Nos. 3, 4, and 5, should produce the same amount of irritation as ordinary washing powders, composed largely of sodium carbonate, or laundry soap would produce if we used these products in the nursery to bathe the babies. We feel, also, that there is a strong possibility that the irritating alkaline solution is at times the cause of pemphigus.

SUMMARY

From the foregoing observations we can say positively that: first, no liquor cresolis compositus which has not been titrated to determine its free alkalinity should be used in delivery rooms or nurseries in such a way that it might come in contact with babies' skins, no more than we would wash diapers in strong alkali; second, that one cannot eradicate an epidemic of pemphigus by changing the solutions in the delivery room or nursery without resorting to the usual methods of isolation and prevention, because, when an epidemic is once started, the mild staphylococcus increases in virulence as a result of its rapid transmission from one host to another, to such an extent that it becomes capable of infecting a normal nonirritated baby; third, as a precaution against the common form of impetigo, young children should be prohibited from visiting newborn babies during their confinement to the hospital.

A METHOD OF OBTAINING VAGINAL SECRETION FOR
BACTERIOLOGIC EXAMINATION WITHOUT THE POS-
SIBILITY OF VULVAL CONTAMINATION*

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WISHING to investigate certain phases of the bacterial flora of the vagina, we were early impressed with the difficulty of obtaining secretion which could be regarded with certainty as the uncontaminated contents of the vagina. Because of the anatomy of the genitalia, exposure of the vaginal vault without the probability of contamination from the labia has presented difficulties which we do not believe have been overcome up to this time. In most of the reported bacteriologic investigations the vaginal cultures were obtained in one of two ways: by the exposure of the vaginal vault with a sterile speculum; or by the use of the Menge tube. Both of these methods have been described repeatedly so that repetition of them seems unnecessary.

Williams¹ has pointed out the difficulties encountered in obtaining uncontaminated secretion from the vagina by means of the speculum. In this method contamination of the vaginal secretion by bacteria from the labia as the speculum is introduced is highly probable. This probability becomes almost a certainty in the case of nulliparae in whom the introitus is so tight that its margins can be separated only to a limited degree. To overcome the possibility of such contamination, many investigators have attempted to sterilize the vulva by means of chemical antiseptics. Two objections may be offered to this. It is more than doubtful if we possess an antiseptic that can be applied to the delicate structures of the external genitalia in sufficient strength to insure complete sterilization. Granting, however, that such sterilization is possible, there is always the danger that some of the antiseptic may be carried up into the vagina by the speculum and thus, partly at least, affect the growth of the bacteria in the vaginal secretion. To test the force of the latter objection the labia of a number of women were thoroughly painted with a 2 per cent aqueous solution of mercurochrome. A small speculum was then introduced, care being taken to part the labia as widely as possible, and in every instance the tip of the speculum was found to be stained with the antiseptic.

The Menge tube would seem to have at least one advantage over the speculum in that it is only 5 mm. in diameter and thus does not afford

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so wide an area for contamination as the speculum. It would appear, however, that there is no way to protect the edges of the fenestrum in its outer tube from contamination by bacteria in the lowermost part of the vagina or on the labia. Obviously, if the edges of the fenestrum become contaminated the contents of the inner tube will not truly represent the bacterial flora of the upper vagina. That the Menge tube possesses little if any practical advantage over the speculum has been shown by Fricke,² who, after a study of the vaginal secretion of 50 pregnant women, came to the conclusion that streptococci were found with equal frequency when the secretion was obtained by the speculum or Menge tube.

DESCRIPTION OF METHOD

To obviate the dangers of contamination inherent in both the speculum and Menge tube, we have developed a device which enables us to obtain a sufficient quantity of vaginal secretion for bacteriologic study, and which we think can be regarded as representing the true secretion, uncontaminated by organisms from the



Figure 1.



Figure 2.

Fig. 1.—Device assembled and ready for use.

Fig. 2.—Device in the vagina after swab has been pushed out.

labia. This consists of a tube of ordinary 8 mm. laboratory soft glass, 120 mm. in length. Fitting snugly, but permitting free motion within it, is a second glass tube, made of the same material and measuring 220 mm. in length. A rubber cylinder made of ordinary thin rubber glove stock, measuring about 120 mm. in length and 7 mm. in diameter, and open at both ends, is drawn over the lowermost 30 mm. at one end of the outer tube, in such a way that about 45 mm. of it projects beyond the end of the glass tube, while the rest of it is rolled on itself so as to form a cuff, which secures a tighter fit, as shown at (a), Figs. 1 and 2. The inner glass tube is then pushed through the free end of the outer tube and, when its extremity reaches the lower end of the latter, the projecting end of the rubber cylinder is invaginated into the inner glass tube, the rubber being thrown into folds, as shown at (b), Fig. 1. To prevent slipping, the junction of the outer and inner tubes is wrapped with a wisp of cotton, as shown at (c) in the figures. An ordinary wooden applicator, 300 x 2 mm., covered with a cotton swab at one end, is inserted through the free end of the inner tube until it comes to rest upon the infolded end of the rubber cylinder and is fixed at that point by wrapping the junction of the applicator and the inner glass tube with a wisp of cotton, as shown at (d) in the figures. Fig. 1 shows the device completely assembled. It is placed in a large test tube, wrapped in a double cover and sterilized in the autoclave. These tubes may be prepared in quantity and used as desired.

When taking a culture, without preliminary disinfection, the labia are parted as widely as possible. The rubber-covered end of the outer tube is gently placed

within the introitus, care being taken that it is not pushed up into the vagina. Then, while holding the outer tube in place with the left hand, pressure is exerted upon the inner tube with the right. As the latter is pushed down, the infolded rubber cylinder gradually emerges and unfolds until finally the free end of the inner tube slips through the rubber covering and comes to lie high up in the vaginal vault. It should be particularly noted that the rubber cylinder is not pushed up in the vagina, but simply unfolds from the end of the tube, so that the end of the inner glass tube is not exposed until it emerges from the end of the rubber cylinder. The applicator stick is then pushed down until the cotton swab comes into contact with the vaginal wall. A few turns of the stick enable the swab to collect enough of the vaginal secretion for bacteriologic study. The stick and swab are then withdrawn while the tube is still in place and are placed in a sterile test tube or the appropriate media are directly inoculated. Fig. 2 shows the tube as it lies within the vagina with the cotton swab projecting beyond the end of the inner tube.

In using this device the only difficulty we have encountered is that the rubber cylinder may stick as it emerges from the inner tube. This, however, can be obviated by dusting the cylinder with talc as the device is being assembled. The glass tubes, as well as the rubber cylinders, may be used repeatedly. At first we determined the point of emergence of the inner tube through the rubber cylinder by a mark on the inner tube, but, with a little practice, this was found unnecessary, as it is evidenced by a slipping sensation transmitted to the fingers.

In our hands the above described apparatus has proved very satisfactory. After it has been assembled and sterilized a vaginal culture can be taken within one or two minutes and requires no preparation on the part of the patient or operator.

Since the point of prime importance is to make sure that no bacteria are carried up into the vaginal vault from the labia, we subjected our apparatus to the following test. The external genitalia of ten women were generously swabbed with a twenty-four-hour bouillon culture of *Bacillus prodigiosus*, which can do no harm, as it is a non-pathogenic organism which is characterized by the formation of red pigment. Then, without attempting to sterilize the labia, vaginal cultures were taken by means of the device described above, and the material was immediately planted on potato slants. After forty-eight hours of incubation no red colonies of the *Bacillus prodigiosus* were found on any of the ten slants, thereby conclusively demonstrating that no bacteria had been carried up into the vagina from the labia.

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SPONTANEOUS RUPTURE OF THE UTERUS IN LABOR FOLLOWING STURMDORF TRACHELOPLASTY

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POSTOPERATIVE cicatricial atresia of the cervix has long been recognized as a cause of dystocia. As early as 1883 Murphy¹ reviewed eleven instances of this occurrence. Audebert² in 1898, Guibot³ in 1900, and LePage⁴ in 1903 reported difficult labors following trachelectomy, LePage's case necessitating Porro-cesarean section. In 1913 Leonard⁵ tabulated the immediate and late results of one hundred and twenty-eight patients upon whom high amputation of the cervix had been done, and found that "fifty per cent of the pregnancies occurring after cervix amputation terminated prematurely, while among the few who progressed to full term, even a larger proportion experienced difficulty and prolonged labor." A subsequent analysis by the same writer⁶ of thirty-nine cases of trachelorrhaphy indicated that following this operation labor was almost always normal. Rawls⁷ on the other hand, in an exhaustive study of the end-results of two hundred and eleven cervical operations at the Woman's Hospital, New York, showed that in this series at least trachelorrhaphy rather than amputation predisposed to dystocia. Of his thirty-two trachelorrhaphy cases later becoming pregnant, three required cesarean section on account of cervical rigidity.

While the older operative procedures on the cervix have thus been carefully investigated concerning their effect on subsequent labor, similar quantitative studies on the now widely used Sturmdorf tracheloplasty are apparently lacking. Polak,⁸ in a review of the end-results of three hundred and fifty cervical operations, reports that both trachelectomy and tracheloplasty (Sturmdorf) may result in dystocia, the latter less frequently than the former. He cites two cases of cesarean section done in his clinic for cervical dystocia of this kind, but does not mention whether the antecedent operation had been amputation or tracheloplasty. In a later communication⁹ he sounds an emphatic warning against the too widespread use of cervical surgery on women in the child-bearing age. Magid¹⁰ and Coventry,¹¹ however, feel that the Sturmdorf tracheloplasty has no influence on labor, the former reporting nine and the latter two cases of successful delivery after the operation.

The following instance of rupture of the uterus subsequent to Sturmdorf tracheloplasty is, as far as the writer could determine, the first of its kind to be recorded.

Hosp. No. 9699.—A Korean woman, age thirty-two, entered the Out-Patient Department of the Peking Union Medical College December 17, 1924, complaining of profuse, intractable leucorrhea of ten months' duration. She had had four full term spontaneous deliveries, the last just prior to the onset of the present complaint. The patient, being a Korean, did not speak the language of North China, and consequently linguistic difficulties rendered the history rather scanty and unreliable. The date of her last menstrual period was uncertain, probably near November 21. No important abnormalities, except a massively hypertrophied, nodular cervix with deep stellate lacerations were found. There was extensive cyst formation on the upper lip and eversion of the lower lip, which bled easily. She was advised to enter the hospital for operation. This she did on December 20.

Operation.—Following a week's preparatory treatment, operation was done on December 27. Ether anesthesia (open), cervix dilated to 10 mm., using Hegar dilators. Circular incision and dissection of cuff of mucous membrane was carried out just exterior to infected area. The cervical canal and surrounding tissues were coned out, and four sutures of chronic catgut, No. 2, twenty day, were taken after the manner of Sturmdorf. Hegar dilator No. 5 passed easily through the cervix. Uneventful convalescence. Examination, January 12, 1925, showed cervix completely covered with pale pink, glistening epithelium. Discharge slight. Cervical canal open to probe. Result recorded as "good." Discharged with advice to return in a month for examination.

Examination of cervical tissue showed chronic endocervicitis.

Second Admission.—Patient did not return for examination as directed and failed to answer follow-up inquiries, but entered hospital again August 28, 1925 at 10:30 A.M., in active labor. Pains had started at 4 A.M. The membranes had not ruptured. Pelvic measurements normal. Position L. O. A., fetal heart left lower quadrant, rate 130, good quality. Head engaged and low in pelvis at level of ischial spines. Cervix 3 cm. dilated (rectal).

2 P.M. Labor pains severe in character, occur every 3 to 4 minutes, lasting 30 seconds. Slight vaginal bleeding with each pain. Patient anxious and restless. Suffers inordinately from pains. Cervix 4 to 5 cm. dilated, oval in shape; cervix and lower uterine segment thinned out (rectal). Diagnosis of threatened uterine rupture made. Husband sent for in order to obtain permission for immediate cesarean section.

2:40 P.M. Pains suddenly ceased. Clinical picture entirely changed. Patient now apathetic and oblivious to surroundings. Head lolls from side to side. Her eyelids are closed, her eyeballs rolled up so that only the sclerae are visible. She refuses to lie on her back and insists on sitting up, but needs support for this. Pulse weak and becoming more rapid, finger tips cold and blue. Blood pressure 90/50. Patient complains bitterly if pressure is made anywhere on abdomen. Vaginal bleeding increased in amount. Fetal heart not heard. Vaginal examination: Head now high in pelvis. Cervix (or laceration) now 6 to 8 cm. dilated. A diagnosis of rupture of the uterus was made and the patient prepared for celiotomy.

Operation.—Infant weighing 3,050 grams found with head and right arm extruded into peritoneal cavity. Left uterine wall site of laceration 12 cm. long extending upward from vagina, through cervix, and into lower uterine segment. Supravaginal hysterectomy. Uneventful, afebrile convalescence.

The case presents several notable features:

1. Rupture occurred after less than eleven hours of labor.
2. The patient was from two to three weeks' pregnant when the tracheloplasty was done. Under the circumstances mentioned, this coincidence was unavoidable. It is striking, however, that the operative

trauma, including a dilatation to No. 10 Hegar dilator, did not precipitate abortion. It would also have been thought that the physiologic softening which the pregnant cervix undergoes would have hindered postoperative fibrosis sufficiently to prevent the intense cicatricial rigidity present in labor.

3. Convalescence following the hysterectomy was surprisingly smooth, attesting the favorable prognosis of those cases which have had no contaminative vaginal manipulation, and have had immediate diagnosis and early operation.

4. The cervix was patent to a No. 5 Hegar dilator at the close of the operation and to a probe fifteen days later. Any gross blunder such as actually "sewing up" the cervix can therefore be dismissed. (Cases are known in which this has occurred, hematometra resulting.)

It is impossible to draw conclusions from one isolated case. Sturmdorf tracheloplasty has in general given excellent results in this clinic; we find it the only adequate means of treating many advanced cases of endocervicitis, and we would not want to condemn its use even in women of the child-bearing age simply on the score of this one unfortunate experience. We would like, however, to record the case in order that it may have due consideration in any ultimate summary that may be made of the late results of the operation.

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INTRAPERITONEAL HEMORRHAGE COMPLICATING ABORTION

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IINTRAPERITONEAL hemorrhage complicating spontaneous abortion is a condition rarely met with in gynecologic practice. Few textbooks even mention it as a possible complication of abortion. It undoubtedly occurs often but in so slight a degree as not to be recognized. Possibly much of the pelvic pain and tenderness in abortion is due to the irritation from a slight hemorrhage into the peritoneal cavity. Only in cases where the hemorrhage is of sufficient quantity to produce severe symptoms, necessitating operation, is such a condition recognized. If uterine blood and mucosa so frequently reach the peritoneal cavity through the tubes during menstruation, as Sampson has shown, may they not also do so in abortion?

During menstruation the tubal mucosa becomes congested and a slight effusion of blood into the lumen may take place. This is probably infrequent, however, and is of little practical importance as a source of menstrual blood. Evidences of tubal effusion are, that tubes fastened in the abdominal wall often show a periodic bloody discharge and, that a decidua menstrualis has been found in the tube.

During pregnancy the tubes are stretched out, varying in length from five to nineteen cm. and they hang perpendicularly at the sides of the uterus. The tube wall becomes thickened, but no muscular hypertrophy normally occurs. The mucous membrane becomes thickened and congested and a moderate decidual change has been observed in the tube in normal intrauterine pregnancy. The uterine end of the tube is closed normally by the decidua during pregnancy but the fimbriated end is open.

Occasionally at operation blood may be found escaping from the fimbriated end of the tube during menstruation. This may readily happen as both ends of the tube are patent during the menstrual phase. Sampson has recently shown that uterine stroma and blood frequently reach the peritoneal cavity during menstruation, with consequent transplantation of the uterine stroma in the ovary, intestine and other organs.

During pregnancy the uterine end of the tube is closed by the intrauterine decidua. Thus intraperitoneal bleeding from the uterus during pregnancy presupposes a patent interstitial portion of the tube. Several conditions causing backflow of uterine blood during pregnancy or during an abortion are believed to exist.

1. The uterine end of the tube becomes patent, due to dilatation of the muscularis, much as the change taking place in the cervix, the uterine decidua vera separating from the wall of the fundus and cornu.

2. Uterine blood is dammed back by an undilated and closed cervix or by blood clots or tissue blocking the uterine canal, the back pressure being sufficient to cause bleeding through one or both tubes into the peritoneal cavity.

3. Uterine tumors, as myomata, or uterine malposition may occlude the cervical canal with resultant back pressure. Two small myomata were present in the posterior uterine wall of the case reported but their size and location make it improbable that they were a factor in the intraperitoneal bleeding.

The following case, apparently one of intraperitoneal hemorrhage complicating abortion, came under our observation.

CASE REPORT

Patient, white, age thirty-two, married, was first seen Feb. 22, 1922. December, 19, 1921, was the first day of the last menstrual period. For six weeks she had some morning nausea and felt as she did in her two previous pregnancies. On Feb. 20 she felt well all day, but on going to bed she noticed a slight bloody vaginal discharge, with no pain. Feb. 21 the flow continued, was of moderate severity and a few small clots were passed. That afternoon she began to have a dull and aching pain in her left lower quadrant and in her pelvis. Feb. 23 the pain was more severe and her side was very tender, but the vaginal bleeding was less. That afternoon she had five or six severe sharp bearing-down pains in her pelvis and left side. She did not feel faint; there was no nausea, vomiting or chills. That night at nine o'clock she was brought to the hospital. Her pain was severe and knife-like and was localized in her left lower quadrant.

The patient had had no previous illnesses. Her menses began at thirteen years of age, were regular twenty-eight-day type and lasted four or five days. She had two children, five and three years of age. Her labors were normal. She had had no miscarriages.

The patient's general condition was good. She walked in a stooped position. Her color was good. Her temperature was 99.4°, pulse 85 and respirations 24. The breasts showed evidences of early pregnancy. The abdominal wall was thick, but there was no distention. There was marked tenderness and slight rigidity in the left lower quadrant. No mass was palpable. Bimanual examination showed a scant bloody discharge with no odor. The cervix was soft, the os barely admitting one finger. The uterus was enlarged to the size of a two months' pregnancy; it was soft and movable but seemed displaced to the right. The right tube and ovary were normal. To the left of the uterus and in the culdesac there was marked tenderness and a definite boggy feel, but no mass was palpable. A catheterized specimen of urine was normal, her hemoglobin was 80 per cent and leucocytes 18,900.

The clinical picture was clearly that of abortion, though not all of her symptoms or findings could be explained on that basis. The slow onset with hemorrhage and later bearing-down pain was typical of abortion. The sharp pain in her left side, the tenderness, the displacement of the uterus to the right and the marked doughy feel to the left and posterior to the uterus were obviously due to some other condition. The findings, along with a 19,000 leucocytosis, indicated a localized peri-

tonitis, with probably a collection of blood to the left of the uterus. The diagnosis of ectopic pregnancy could not be ruled out. The pain, tenderness and localized findings could be explained by an ectopic with a slight hemorrhage.

Operative Notes.—Ether anesthesia. The parietal peritoneum was dark, there were no adhesions. Approximately 300 c.c. of dark, grayish red blood, with no clots, were present in the culdesac. The uterus was symmetrically enlarged to the size of a two months' pregnancy. Two subserous myomata, each 2 cm. in diameter were present in the posterior uterine wall.

The left tube was enlarged in its middle third for a distance of four cm., its serosa was normal, no mass was palpable in the tube. By pressure on the uterine fundus or by repeated milking of the tube from the uterus to the fimbriated end, fluid blood could be obtained through the fimbriated end, two or three c.c. being obtainable at each milking. The right ovary contained a corpora vera. There was no broad ligament mass, the tube was not twisted and there was no engorgement of the veins of the broad ligament. The right tube was normal.

The left tube was removed and the culdesac mopped dry. The appendix contained fecaliths and was removed. The abdominal wall was closed without drainage.

The specimen removed consisted of an amputated fallopian tube, 8 cm. in length. The middle third was swollen and felt cystic. It had a diameter of 18 mm., its serosa was normal, no mass was palpable. On section, the mucosa of the middle third was swollen and red. There was no ulceration or bleeding point. The mucosa was smooth and velvety.

Paraffin sections made by E. T. Bell of the University of Minnesota showed many clumps of polymorphonuclear and mononuclear cells in the mucosa, particularly in the middle third, but also near the fimbriated end. There was no evidence of a decidua or of a tubal pregnancy. It was diagnosed as acute suppurative salpingitis.

Postoperative Notes.—The patient's convalescence was normal. The night of the operation she expelled several large clots, thirty-six hours later she expelled fetal elements. She passed a few small clots for the following three days. Her pain was moderate, her maximum fever was 100°, and she had no distention or evidence of peritonitis. Her wound healed by first intention and she was discharged from the hospital on the sixteenth day.

COMMENT

In this case an intrauterine implantation unquestionably was present, the pregnancy having reached approximately the eighth week. A spontaneous abortion then took place, complicated by a localized acute inflammation in the left tube. Hemorrhage into the peritoneal cavity also occurred.

The blood had its origin from one of two sources. It may have come from the uterus itself or a tubal hemorrhage may have occurred, caused by the acute salpingitis. Hemorrhage does occasionally occur in acute salpingitis. In this case a considerable quantity of blood could be obtained repeatedly at the fimbriated end of the tube by compressing the uterus or by milking the tube.

The tube, when examined immediately after the operation, showed an intact, slightly reddened mucosa, but no evidence of an oozing surface or a bleeding point could be seen. It seems hardly possible that such a quantity of blood could be obtained from the tube merely by making

pressure on the tube or uterus without some source of hemorrhage being visible.

It seems more probable that the blood came from the uterus through a tube with a patent interstitial portion, the uterine decidua being separated or torn. The local inflammation in the tube may have been secondary to the uterine bleeding. The dilatation of the cervix was slight and the cervical canal was narrow. This and the presence of a blood clot could have produced sufficient back pressure to force the blood out through the tube into the peritoneal cavity.

The literature available contains no case reports of intraperitoneal bleeding from the uterus complicating abortion. Sampson states he believes such a backflow from the uterus is possible. Modern texts on obstetrics and gynecology do not mention such a condition as occurring. Sampson has shown that there is a great difference in the diameter of the tubes in women, especially the interstitial portion. He thinks escape of menstrual blood would be very frequent if the interstitial portion were large in all women. DeLee in his text states that in curettage for incomplete abortion the curette may slip into the tube.

Possibly the woman in the case reported, had tubes with a large interstitial portion. A break or separation in the decidua vera and back pressure from any of the causes mentioned would have made possible hemorrhage into the peritoneal cavity by way of the tube. This complication of abortion may possibly occur quite often but be of so slight a degree as not to be recognized.

SUPERNUMERARY BREAST NEAR LABIUM

BY J. WARREN BELL, M.D., PH.D., MINNEAPOLIS, MINN.

(From the Department of Obstetrics, St. Mary's Hospital)

THE patient was twenty-three years old when she noticed this tumor and pregnant for the third time. She fell on some sharp object and was injured in the region of the vulva. She thought that a boil developed because some thin yellow-white fluid appeared at the site of the injury. After that, with each pregnancy the mass enlarged somewhat, never receding between pregnancies. There were nine succeeding pregnancies, the patient having miscarried twice, one miscarriage being a twin pregnancy. Her normally situated breasts were small when at rest but swelled up and remained hard for a week when lactation began.

I first saw her in August, 1922, at the University Out-Patient Department, University of Minnesota. She was then fifty-nine years old. The mass was about the size of an egg, attached just in front of the left labium majus by a pedicle 3 cm. in diameter. The mass was of variable consistency, quite elastic and not attached to the skin, which slid over it easily.

Pelvic examination revealed a senile uterus. The adnexa were seemingly normal.

On September 8, 1922, because of inconvenience which the tumor caused the patient, I infiltrated the pedicle with 1 per cent novocaine and removed the tumor. The wound healed by primary union. The pathologic examination was made by Dr. E. T. Bell, who changed the diagnosis from lipoma to accessory breast.

The specimen measured 7 by 5 cm. and was covered by wrinkled skin except for the cut surface of the pedicle. The tumor was slightly elastic, smooth and symmetrical. No evidence of a nipple could be found. On section the tissue appeared shiny and pink with a few small cystic areas.

The inner portion of the tumor appeared to be made up of loose connective tissue containing a number of large plasma cells and areas of tubes and acini lined with epithelium, which as a rule is cuboidal. Where the acini were dilated the epithelium was proportionately thinned out, and in the larger cysts was of a very flat type. The whole appearance is that of a resting breast with cystic disease present.

In November, 1925, she reappeared with the story that she had a cancer in the pelvis. Examination revealed a change in the pelvic condition, involving induration of the broad ligaments, a nodule in the

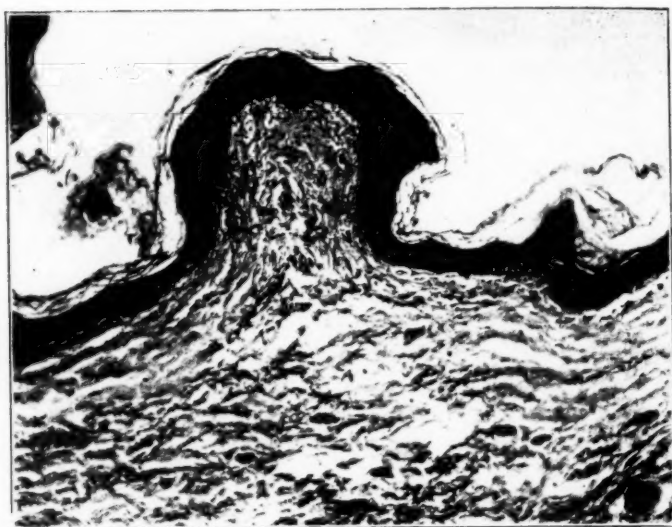


Fig. 1.—Microscopic section of outer portion of tumor showing skin and areolar tissue. The skin is loosely attached.



Fig. 2.—Microscopic section of inner portion of the tumor shows breast tissue with cystic disease present.

rectovaginal septum and infiltration of the vesicovaginal septum, with bleeding on manipulation. The scar of the old tumor site showed no sign of recurrence. A very evident inoperable carcinoma of recent rapid growth had developed since the time of the operation, September 8, 1922.

A later report from the University Hospital where the patient was sent for palliative treatment states that there was an ulcerated crater present and that the tissue was squamous carcinoma.

The subject of polymastia is completely covered by Deaver and McFarland, who bring out the fact that a single supernumerary breast has been reported more than forty times in males and about twice as frequently in females, accessory breasts in the female being chiefly below the normal site, occasionally being found in the region of the labia. My case, I believe, is the third single accessory breast reported in this location. According to Deaver, two other cases appear in the literature with breasts located in the labial region.

Referring to comparative anatomy of the primates, *Tariu spectrum*, in addition to the pectoral glands, has an inguinal pair.

In the aye-aye, *Chiromys madagascariensis*, there is but one pair of nipples situated about an inch and a half in advance of the vulva and about an inch apart.

The lower animals not uncommonly have inguinal breasts, some having breasts on the outer side of each thigh. All cetacea have the mammary glands upon the vulva, i.e., labia.

De Blasio observed a young woman who had upon each side of the vulva on the outer side of the labium majus a mammary gland the size of a hen's egg, surmounted by a well-formed nipple. Up to the age of puberty only the nipples were observed, the glands developing later and only reaching their maximum size when she became pregnant. The location of these supernumerary organs is precisely that seen in cetaceous animals.

Deaver and McFarland note the formation of the accessory breasts from "anlagen" extending from the axillary to the inguinal regions.

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ST. MARY'S HOSPITAL.

REPORT OF A CASE OF GANGRENE OF THE CECUM IN A NEWBORN INFANT*

By LUCIUS A. WING, M.D., NEW YORK CITY

Maternal History.—Mrs. M. Z., a primipara twenty-two years of age. The mother of this infant was admitted to the Lying-In Hospital on July 5, 1925. The provisional diagnosis on admission was placenta previa.

The patient was at full term, and had noticed irregular uterine contractions together with slight bleeding from the vagina for about three hours before admission. The bleeding had increased somewhat in amount during a period of one hour preceding her coming to the hospital.

Examination showed a firm cervix, with one finger dilatation. The membranes were intact, and the placenta was not palpable. There was a continuous, moderate flow of fresh blood from within the cervix, with occasional small, dark clots.

The bleeding continued during two hours' observation. There was no further dilatation of the cervix, and the uterus became somewhat tonic. A diagnosis of premature separation of the placenta was made, and the patient was prepared for delivery by cesarean section. While preparations were being made in the operating room the fetal heart became very irregular, varying between 120 and 80. The high incision type of operation was done, and a living baby 54 cm. long, weighing 3730 grams was delivered. The placenta measuring 20 by 20 cm. was found high in the uterus, on the right side. It showed an area of separation covered with partially adherent clot, and about a pint of partially clotted blood was found in the uterine cavity. The umbilical cord was 55 cm. long, with two tight coils about the child's neck.

Mrs. Z. made an uneventful recovery, and was discharged from the hospital on the twelfth day in good condition. The mother's previous history was irrelevant. Her Wassermann reaction was negative.

History of Infant.—The baby was a well-developed male, perfectly normal in appearance. On account of the mother's operative delivery he was not put to the breast during the first twelve hours after birth. During the following twelve hours the baby vomited on several occasions, the vomitus consisting of clear fluid and mucus, slightly bile tinged. During the third twelve hours a marked abdominal distention developed, vomiting continued at intervals, and the baby refused to nurse. There was no meconium in the vomitus. No abundant stool was observed, but a colonic irrigation brought meconium stained fluid.

An exploratory laparotomy was done under ether anesthesia when the infant was thirty-six hours old. A right rectus incision was made, and upon opening the peritoneal cavity a large amount of free gas escaped, and a small amount of meconium was observed. The meconium was found to be coming from several minute perforations in the cecum, and the whole of the caput coli was found to be in a condition of early gangrene. The lower portion of the ileum was moderately distended, and filled with meconium. Further exploration revealed three peritoneal bands which passed obliquely across the cecum in its upper portion, binding it down firmly to the posterior abdominal wall. When these bands were divided, the cecum could be lifted up in a normal manner. Each band was about 3 mm. wide, and 3 cm. long, and they lay to-

*Read at the Thirty-eighth Annual Meeting of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, held at Hot Springs, Va., September 16, 17, 18, 1925.

gether like a small bundle. No further anomalies were observed. Some meconium had passed into the large intestine. The cecum was brought into the wound and secured there with several fine sutures, and the abdominal wound closed except for a drainage opening in the lower angle.

For twenty-four hours the vomiting subsided and the baby seemed improved. After this period, however, the vomiting recurred, an actively spreading peritonitis developed, and the baby died on the fourth postoperative day.

Cultures taken from the peritoneal cavity at the time of operation showed a mixed culture of *Bacillus coli* and *Staphylococcus aureus*.

OBSERVATIONS

Farr and Brunkow, in a recent article,¹ state that the incidence of intestinal occlusion from all sources is about one in twenty thousand. These authors make the comment that since many infants which die are not examined postmortem, a certain number of cases may not be recognized. It is my belief from observations at the Lying-In Hospital during the past ten years that intestinal defects are much more frequent than was formerly believed. Most observers agree that developmental faults are the most frequent cause of the various abnormalities and defects of the intestinal canal. Among additional causes may be mentioned blocking, or interference with the mesenteric vessels, infections, particularly syphilis, the development of adherent bands, and twisting of the gut. The development of an imperforate portion of the intestinal canal, either single or multiple, appears to be considerably more frequent than a stenosis due to pressure from without.

Congenital defects in other parts of the body have been frequently noted in association with defects of the intestine.

The cardinal symptoms of intestinal occlusion in the newborn are: vomiting, abdominal distention, and failure of the bowels to move in a normal manner. It may be noted with emphasis that an irrigation of the colon may bring away material which appears to be meconium stained without ruling out complete obstruction.

The prognosis in intestinal occlusion in the newborn is rather poor, although recoveries have been reported. Surgical treatment must be early to be of any value. The invasion of the intestinal canal, and subsequent infection of the peritoneal cavity is very rapid in these cases.

In the present instance the baby was delivered by cesarean section, performed while the membranes were still intact. The amniotic fluid was presumably sterile, yet bacterial invasion of the peritoneal cavity occurred early in the second twenty-four hours after birth. As stated, cultures of the peritoneal cavity taken thirty-six hours after birth showed an abundant growth of *Bacillus coli* and *Staphylococcus aureus*. So far as I have been able to ascertain, this is the only recorded case of intestinal occlusion in which the infant was delivered "sterile" and, therefore, without opportunity for the bacteria to enter the mouth or intestinal canal until after birth.

¹Arch. Surg., September, 1925, ii, No. 3, 417.

The general subject of developmental defects of the intestine is one which merits further study and observation, as many of the lesser defects are not incompatible with life, and are now being found a frequent source of digestive and other disturbances during the period of childhood, and even later in life.

114 EAST FIFTY-FOURTH STREET.

(For discussion see page 521.)

REPORT OF A CASE OF TRUE OVARIAN PREGNANCY

By JAMES R. MANLEY, M.D., DULUTH, MINNESOTA

THIS patient, twenty-six years of age, with one child three years old, complained of pain in the lower abdomen, with a slight vaginal bleeding, when I first saw her on November 22, 1925. She stated that her last regular menstrual period was October 9, six weeks before. On November 15, while at dinner, she was suddenly seized with abdominal pain which caused her to faint, and there was slight bleeding from the vagina.

She got over this in a few days and felt well until November 22, when she had another attack of pain, not so severe. There was also some slight spotting of blood. Physical examination was negative with exception of the lower abdomen, which was distinctly tender on the left side. Vaginal examination showed the uterus slightly enlarged in ante flexion and a small mass in the left culdesac the size of a crab apple, which was extremely tender. Diagnosis was made of extra-uterine pregnancy. She was operated upon the following morning.

The operation disclosed about six ounces of free blood in the abdominal cavity; the left ovary was the site of a hematoma about an inch and a half in diameter which had ruptured. The left tube was free; there were no adhesions, and aside from a slight congestion, the tube was perfectly normal. The uterus was enlarged to about a six weeks' pregnancy and had the appearance of a pregnant uterus. The ovarian hematoma was removed and the wound closed.

The patient made an uneventful recovery, vaginal bleeding starting on the third day, about normal in amount for a regular menstrual period. The nurse stated that some membrane was passed but unfortunately it was not saved for examination.

The specimen removed was nearly round, about an inch and a half in diameter and formed partly by blood clot, which on section was shown to form about one-half of the mass, and partly by ovarian tissue in which was a large area of corpus luteum, which formed the boundaries of the hematoma. Inside of the blood clot part of the tissue was reddish gray in color, easily distinguished from the blood clot, and in the center was a cavity in which an embryo measuring a centimeter in length was found. Outside of the corpus luteum ovarian tissue could be recognized grossly, completely surrounding it, with the exception of an area about three centimeters wide near where the rupture occurred.

The microscopic description by Dr. G. Berdez was as follows: Sections through the embryo show degenerative changes, several structures, however, are easy to recognize. Sections through the corpus luteum and adjoining blood clot show that the hematoma contains numerous typical fetal villousities, which are lined by an epithelial and syncytial layer. In places the syncytium shows a very fine ciliated lining. The villousities, together with the surrounding blood, penetrate into the superficial layers of the ovary. There the ovary shows a layer of decidua-like cells, which at one place goes over without sharp transition into the cells of the corpus luteum.

Several sections in different areas show the ovarian tissue outside of the corpus luteum and blood clot. Ovarian tissue also shows several primitive follicles and also a fibrous body, an atresic follicle. Anatomical diagnosis: ovarian pregnancy.

Comment.—A primary ovarian pregnancy is the result of fecundation of the ovum while still within the graafian follicle. The conditions which must be fulfilled if the specimen in question is to be regarded as one of proved primary ovarian gestation are as follows:

1. The tube on the affected side must be intact.
2. The fetal sac must occupy the position of the ovary.
3. The pregnancy must be connected to the uterus by the utero-ovarian ligament.

4. Ovarian tissue must be found in the sac wall. Williams adds to this a fifth condition: that ovarian tissue must be found in several portions of the wall, at some distance from one another. Another condition, that the embryo itself must be found, is probably not essential.

In the case reported all of these conditions were fulfilled, even to finding the embryo within the ovary.

500 FIDELITY BUILDING.

Department of Maternal Welfare

CONDUCTED BY FRED L. ADAIR, M.D.

THE DISTRICT NURSING ASSOCIATION OF BUFFALO

THE District Nursing Association of Buffalo, among its other activities, includes that of a maternity nursing service, which includes the care of the pregnant patient during the prenatal period as well as in labor and puerperium. This, as well as other services, is rendered free to those who are unable to pay. "The actual cost of the visit of the nurse must be paid whenever possible, and those able to pay more than the cost of the visit are required to do so."

The association has "maternity baskets" for rent to persons who are unable to procure the necessary linen, etc., for the time of confinement, for which it charges a rental fee of five or six dollars. There is no necessity for any pregnant woman in the city of Buffalo to be without nursing care. The fee is always in proportion to the means of the patient, from twenty-five cents to one dollar and a half per visit. Those unable to pay are, of course, not charged. Nurses are furnished for the period of labor for seven and one-half to ten dollars per case. The nurse is the intimate link between the patient and her physician. As every child has a right to be well born, so every woman has a right to trained nursing and medical protection.

The association has four night nurses for obstetrics. The work during the day is done, first, by one special nurse, and after she has been called on a case, nurses from the general division are called upon in turn to take care of obstetric cases. No case is carried without the consent of the doctor in attendance. If no doctor has been engaged, the family is instructed to call one. If they are unable to pay a physician, the clinic and hospital are recommended. If a midwife is to take charge, an examination at the "Prenatal Clinic" is advised, after which the nurse follows the directions of the doctor at the clinic, until the midwife assumes charge of the case. The nurses, at all times, try to make each prenatal visit one of cheer and friendliness, as well as to obtain a report of the exact physical condition without causing any fear or misgiving.

The rules governing the relations to physicians are quoted from the "Manual:"

"1. A staff nurse of the Association responds to a call without comment, but no case can be carried for longer than two visits without a licensed, medical practitioner in attendance.

"2. When there is no physician in attendance and the family is able to prove inability to pay a doctor, the nurse shall call the City Health Center for free medical care. When a family is able to engage a private physician it must make its own choice; the nurse is prohibited from recommending one.

"3. Nurses are forbidden to receive orders from patients or any member of the family, even though they are said to come from the doctor. When talking to doctors, nurses should request them to leave written orders whenever possible and especially at time they decide to call the nurse.

"4. Nurses must communicate with physician in charge at least once on every case.

"5. Nurses cannot recommend a change of physician nor can they recommend hospital treatment without consent of the physician.

"6. Excepting in case of 'special delivery nurses' no staff nurse may be used by a physician as an anesthetist."

The superintendent of the Association is Mrs. Anne L. Hansen, R. N., whose most recent report, noted below, shows the steady increase in the service for the past three years. During 1923 special nurses were for the first time employed for the period of labor. The gratifying growth of this service is an evidence of its need.

RECORD OF MATERNITY SERVICE RENDERED BY THE BUFFALO NURSING ASSOCIATION

YEAR	GIVEN PRENATAL CARE	ATTENDED THROUGH DELIVERY	POSTPARTUM CARE (INCLUDING ALSO PRENATAL CARE AND DELIVERY)
1923	1354	334	2952
1924	1849	699	2997
1925	2960	1105	3674
FOR JANUARY 1926	191	107	276
FOR FEBRUARY 1926	169	99	259

F. L. ADAIR, M.D.

Society Transactions

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS

THIRTY-EIGHTH ANNUAL MEETING

HOT SPRINGS, VA., SEPTEMBER 16, 17, AND 18, 1925

DR. ASA B. DAVIS OF NEW YORK, PRESIDING

(Continued from March)

REPORT OF THE JOINT COMMITTEE ON MATERNAL WELFARE

DURING the past year the work of the committee on Maternal Welfare has been prosecuted as it could best be done, handicapped by the conditions which have been encountered.

Dr. Schwarz has addressed several important medical gatherings in the southwest, and Dr. Kosmak kept appointments in New York, Pennsylvania, and New Jersey, dealing with the subject from various angles, medical and sociologic. The chairman was invited to appear before the Detroit Obstetrical Society, the Wayne County Medical Society, the Public Health Section of the Detroit Federation of Women's Clubs and the radio audience of the Detroit Free Press, April 7, where "Maternal Welfare" was given one afternoon and evening.

The annual meeting of the Public Health Nurses of Missouri, combined with the County representatives of the Missouri State Board of Health, was the occasion for a talk on Maternal Welfare by the chairman.

A number of district and county medical societies in Kansas and Missouri have invited members of the committee to furnish a program at some meeting during the year; whenever possible, this engagement has been fulfilled by personal acceptance. When this has been found inexpedient, it has been arranged that the service of one of our appointees in whichever state the meeting was to be held should be solicited to attend, and in every instance the response has been favorable.

We feel, therefore, that the work of the committee has become really organized and is well under way, and hence is no longer experimental.

Some idea of the appreciation of the work of the committee may be realized when we note that our report of last year was quoted by Dr. H. MacMurehy, in the 1925 Canadian Public Health Congress; abstracted by the Year Book in Obstetrics, by the Dental Cosmos, of Philadelphia, by Hospital Progress, a journal published in Milwaukee, and by editorial comment of a number of State Medical Journals, throughout the year.

In the early summer a meeting of a committee, under the chairmanship of Dr. Robert L. DeNormandie, of Harvard Medical School, was called by the Children's Bureau, to meet in Washington, to formulate a simple standard for prenatal care and obstetrical technic, and also to suggest a practical prenatal chart for general

use in the obstetrical service of physicians whose patients are confined in the home. This committee, in addition to Dr. DeNormandie, consisted of Dr. F. E. Kraker, Director of Division of Maternity and Infant Hygiene, Children's Bureau, Department of Labor, Washington, D. C.; Dr. Fred L. Adair, of the University of Minnesota; Dr. Ralph Waldo Lobenstine, of the New York Maternity Center; Dr. Frank W. Lynch, of the University of California; Dr. Florence L. McKay, Director of the New York State Board of Health; Dr. A. M. Pickett, of the University of Louisville; Dr. Otto H. Schwarz, of Washington University and your Chairman. The material for the final report is now in the hands of the chairman, Dr. DeNormandie, and will soon be ready for release by the Bureau.

A meeting of the Joint Committee on Maternal Welfare was held on the following day. This committee consists of three members from each of the following organizations—the American Gynecological Society, the American Child Health Association, and the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons. The report of the Joint Committee has already been presented to the American Gynecological Society. In this report the activities of the committee were stated and some resolutions which had been drafted were approved and recommended for adoption by the various constituent societies. Groups of states had been assigned to the various members of the Joint Committee with the idea that they should push the idea of Maternal Welfare in those states through state leaders.

These are to select speakers, associated with the constituent societies if possible, and other qualified obstetricians, to aid in the work of addressing medical and lay gatherings on maternal welfare.

Work of this type has already been done through the Bureau of Regional Consultants of New York, and that of Ohio, and of the recently elected Bureau of Missouri, under the auspices of Dr. Ira Brown Krause, Director of Welfare of the Missouri State Board of Health.

Dr. George W. Kosmak, Editor of the *AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY*, announced the inclusion of a Department of Maternal Welfare to be established by the Journal, and outlined the scope of the undertaking. This is the first effort made by any medical publication to stress in a definite way our activities and we hail with delight the promise of this publicity.

In 1909 Dr. Schwarz was a member of the Committee of One Hundred of the American Medical Association, on reform of the medical college curriculum, at the meeting held in Chicago; and your Chairman attended the meeting in Baltimore of the Curriculum Committee of the American Medical College Association, as a representative on obstetrics. We were both impressed with the incongruity of the division of the time of the undergraduate student of medicine, with reference to the importance of the subjects which go to make up his hours in the third and fourth years.

No great advance was made following these meetings, and from the report made last May, before the Medical College Association, by Dean Rowland, of the University of Maryland, whose paper was published in the *Journal of the American Medical Association*, 1925, very little change has since been observed in the medical college curriculum.

It has always occurred to us that surgery in general which, for the average practitioner, is a matter of diagnosis and of minor emergencies, has been accorded an importance quite out of proportion with the other lines of work that he will have in his future practice. In relative value the ratio will be about as follows: medicine 50 per cent; obstetrics 35 per cent; minor surgery, fractures, life insurance examinations, etc., 15 per cent.

With this thought in mind in order that the schedule for the hours assigned to the various branches of the curriculum for this year could be made available for a comprehensive study of the comparative limits of the various required and

optional courses, the Chairman asked the Secretary of every medical college in the United States to send us a copy of the school's catalogue announcement. Since a large proportion of the colleges responded, the figures as presented are approximately accurate. A careful analysis agrees with the report of Dr. Rowland, that the time allotted in the college to obstetrics is about 4 per cent; and 18 per cent is the general average of the hours for surgery, exclusive of the surgical specialties.

Now let it be clearly understood that the Committee is not finding fault with the teachers of surgery for securing these hours of instruction. The contrast between the practical need, in the student's course in obstetrics, which is to become so large a volume of his life's work, and of major surgery, of which the general practitioner will make so little use, is the point emphasized. He must know his obstetrics. It comes in his daily problems and the end of each emergency may be fatal. The glaring fault of high morbidity and mortality in obstetrics, as Dr. Lynch, Dr. Newell, Dr. Davis, and Dr. Rowland argue, is that the neophyte in medicine is self-taught in obstetrics. He has forgotten the didactic lectures he has heard before his final examination and he had not had sufficient clinical training to give him control of the principles of obstetrics, necessary for the recognition of toxemia, malposition, pelvic deformity, and all the dangers he must encounter, perhaps in his first private case. Consequently he goes into the home of the unsuspecting woman who, without knowledge of his lack of training and experience, has called a doctor to care for her in her labor. In absolute contrast to the work in the hospital, where he had constant supervision, an expert in attendance to arrange his patient, he takes charge in an unknown field. In the hospital and clinic he had been dependent on the result of his diagnosis, technique, and the postpartum condition of the patient for his grades, which are to play no small part in his final examination. In the home, with little or no material for asepsis, no assistance and, above all, no intelligent supervision, he takes the chance that what he fails to do will not find him out; often this bluff succeeds, more often it fails.

Without careful measurements, or diagnosis of presentation and position, with a desire to get through and away, he becomes restless; or the family shows a disposition to want something done. He makes a vaginal examination, repeats it again and again. This expedient reveals nothing to him, but it is a basis of an assurance that "everything is all right." If the delay is extensive, he puts on forceps, without knowing whether dilatation or rotation has occurred, or he does a version with equal temerity. The result, perhaps, for the infant, an intracranial hemorrhage; for the mother, certainly, a badly lacerated cervix and perineum, and again a severe postpartum hemorrhage. The third or fourth day a chill and temperature disturb his equanimity; sepsis develops. Another death from malaria or "flu" is to be added to the maternal risk rate.

This is not an imaginary sketch, but simply an illustration as to why Dr. Lynch says the self-taught doctor adds to the score of our needless mortality.

Dr. Rowland, in his paper, quotes liberally from our Report on Maternal Welfare, 1924, as to the convincing facts of this most radical defect in teaching, and his deductions are in harmony with these we have set forth.

This subject is so vast and so essential that it can only be mentioned in a general way in our brief report. The committee would like every teacher of obstetrics to read Dean Rowland's paper, and to call it to the attention of the authorities of the schools, so that the defect in medical education may be corrected.

Dr. Lynch's ambition that each student before graduation must have attended seventy-five cases of labor, all under supervision, is perhaps Utopian, with the present amount of clinical material available; but every one should have had at least the management of thirty cases each under an instructor.

The plea of the committee is that less time be devoted to those branches of studies more or less cultural, in the curriculum, and more hours given to this one

subject, which does not now have the attention its importance makes essential. It is not expected that the general practitioner will do cesarean section, or other operative obstetrics, but he will do many phases of the work which demand a thorough apprenticeship.

The specific recommendations of the Committee are that the Association use its influence to increase the amount of obstetric teaching, so that instruction in the third year should consist of at least three hours a week, throughout the year. This to include a review of anatomy, physiology of the pelvic region, with a study of normal pregnancy and the mechanism of labor. Consideration of version, breech extraction, forceps delivery, and so forth, should not be included, but these should be taught in small classes by use of the manikin. History taking, diagnosis, and examination of the clinical patient demands at least thirty hours. During the last half of the third year, the student is to attend, as an observer, fourth year lectures on clinical obstetrics. The fourth year, group work in physical examinations in the hospital wards and dispensary are supplementary to the drill in manikin work, with which it should go hand in hand. It is imperative that the student should see as much operative obstetric delivery as possible. By visualizing the actual demonstration, he is brought face to face with the difficulties, before he is forced to assume the responsibility of the personal management of the abnormal type, dependent on his own unguided resources. Obstetrics should occupy in this scheme of curriculum 15 per cent of the hours of the last two undergraduate years in the medical school.

There are several subjects which preeminently demand consideration by our Association. The committee has chosen "The Teaching of Obstetrics" as the topic to emphasize in 1925-1926, as logically following the survey of this last year.

Henry Schwarz, M.D.

George W. Kosmak, M.D.

George Clark Mosher, M.D., Chairman.

A paper on **Precancerous Lesions in the Uterus**, was read by Dr. PALMER FINDLEY, Omaha, Nebr. (For original article, see page 450.)

DISCUSSION

DR. HENRY SCHMITZ, CHICAGO, ILL.—The question arises in my mind, how can we utilize the message that Dr. Findley has brought to us today? I feel that as long as the diagnosis of carcinoma, even the time of treatment, is left to the general practitioner or to those outside of our specialty, we will always have to contend with conditions as they exist at present. How can we correct this? Let us begin in the medical school and imbue the students and practitioners with the necessity not to treat diseases that require a special training. Let us train general practitioners first and specialists afterwards. If a general practitioner should decide to enter a specialty, then let him return to the medical school to receive adequate training of at least three years in his chosen specialty.

DR. HERMAN E. HAYD, BUFFALO, N. Y.—I agree with the Doctor that every suspicion of traumatism of the cervix is potentially a subject for most serious consideration. I think it is a very dangerous thing to leave abrasions and erosions. For instance, I have twice curetted where there was no pathologic condition of the cervix—perhaps simply for a dysmenorrhea—and after a lapse of five or six years an epithelial cancer resulted on that surface, without any question being a result of the traumatism from the dilatation.

DR. JAMES E. DAVIS, DETROIT, MICH.—I appreciate this paper very much because it attacks a subject that needs to be dealt with almost every day in

hospital work. As I see it, there have been two extremes taken by physicians: one is occupied by the exclusive laboratorian, and the other by the exclusive clinician. The first may say that the diagnosis should be made only with the microscope; the second perhaps dwells exclusively upon the symptomatology. Those are the two extremes and we will not get very far proceeding with such extremes or if we teach, as we have been doing in the majority of schools, that the students must learn cancer from the microscope or from the patient when he shows definite symptoms. Particularly has the symptom of bleeding been emphasized over and over again, and the presence of the tumor. As you all know, when there is tumor and bleeding then the case is so far along that it is not much use in making a diagnosis, speaking from the patient's standpoint. All over this country, and in most other countries, there has been neglect in teaching gross pathology and I am sure from the student's standpoint—both the undergraduate and the postgraduate—there is neglect of the opportunity to correlate what is clinical with that which is gross and microscopic pathology. As I see it, if we are going to improve our resources in this particular we must proceed along different lines. I believe less time should be given to training the student in microscopic diagnosis and much more time in the training of gross diagnosis, and the correlation of the gross pathology with the clinical findings, and after that the confirmation, if you will, with the microscopic picture. If we can get those three impressions in the minds of our students we will then begin to progress in this particular.

It is a most difficult problem to diagnose cancer where there is no tumor. Even if we have the three conditions present that Dr. Schmitz has spoken of, I would add two more: one, in cancer the cell never reaches maturity; and, secondly, the cell or cells begin to degenerate early. So there are really five different phenomena that you can note.

DR. WM. SEAMAN BAINBRIDGE, NEW YORK CITY.—There are some facts concerning cancer which are definitely recognized. For example, we know, today, that irritation does cause cancer. This has been demonstrated in experimental work on animals and, to a more limited extent, on man. In cancer of the cervix, the primary irritation may be caused by the work of the surgeon, the obstetrician, or the gynecologist. True, the scar on a cervix may not prove the direct cause of the cancer, but the irritation of neighboring cells by the scar tissue, may prove an indirect factor in the production of cervical carcinoma. As we know, it is not the fibroid itself, as a rule, but the irritated tissue in the vicinity of the fibroid, which becomes the cancer site.

The first danger, therefore, in the use of caustics and electric applications to the cervix, is that of unduly producing scar tissue, followed by irritation of the cells in the neighborhood, epithelial proliferation and, finally, cancer.

Another aspect of the application of these measures to the cervix is that of terminating an early pregnancy in the patient. Twice, recently, I have known of such cases, one of which may assume a medicolegal character.

The third menace in the application of caustics and electric treatments to these erosions of the cervix is that it may cause sterility, thus endangering the individual's happiness and, possibly, her health as well.

In the use of these measures as applied to precancerous erosions of the cervix, one must consider the apparent disadvantages as well as the advantages involved, and it seems to me that among the most obvious of disadvantages, are the three which I have just cited: the possible termination of an early pregnancy, irritation of the cells adjacent to the cervical scar tissue and the likelihood of producing sterility. However, in carefully selected cases I have been employing the cautery for cervicitis with distinct benefit. With Dr. Findley, I feel that the method has a real field of usefulness.

DR. A. J. RONGY, NEW YORK CITY.—I have not seen a single case of cancer of the cervix during the past year. That is not my experience only but also the experience of those who practice among the Jewish people. It is not at all a problem in our hospital service. I have been in charge of a large gynecologic service for twelve years and we seldom get a case of cancer of the cervix, either early or advanced. Whether it is the sexual regulations, instituted thousands of years ago, that have something to do with this, I don't know.

I think gynecologists have been very negligent so far as the treatment of the genital tract is concerned. A sore is never allowed to remain unattended by a surgeon, but a gynecologist will let a sore on the cervix go on for months or years. That, to my mind, is a great mistake. While we do not know the cause of cancer, I cannot see how we can rationally allow an ulceration of the cervix to go on untreated.

For the past year or two I have treated every case of ulcerated or lacerated cervix by the electric knife, not so that the knife destroys the cervical tissue but sufficiently to destroy the irritated and inflamed surface so that at the end of six weeks a new mucous surface is formed and the discharge is practically stopped.

DR. MILES F. PORTER, FORT WAYNE, IND.—I believe one reason that we have made so little progress along the line of understanding cancer to the end of curing it is because we have been paying too much attention to the laboratory and not enough to the clinical findings, and I want to emphasize what Dr. J. E. Davis has said. I believe that our hope lies in teaching our students the gross appearance, the clinical aspects, not of early cancer alone but of potential cancer. When we do that and depend less upon our laboratory findings I believe our statistics will begin to grow better.

I want to cite just one incident. Within the last two months a section of a questionable lesion was sent to three of the best laboratories in this country, including New York and Ann Arbor, and the result was that we got three diametrically opposite reports. One report was that it was an entirely benign affair, and it was so long before we got the report back that by that time it was evident the patient was going to die of malignancy, and we didn't need the laboratory report. I don't want to underrate the laboratory facilities, but I do want to emphasize the importance of curing these cases before they develop into cancer.

DR. FINDLEY (closing).—Answering Dr. Polak's question about the treatment of endocervicitis, I have tried everything and am now resorting to the electric blade. I think if we do away with the discharges due to the so-called endocervicitis, the erosion will take care of itself. The discharge will be increased for the first two or three weeks. I have been satisfied so far with the results I am getting from the electric cautery. I don't know what the remote results will be.

DR. POLAK.—Do you use it as a circular application?

DR. FINDLEY.—By no means. I go from the internal os back to the external os. I burn fairly deeply through the cervical mucosa after dilating the cervix the width of the knife. I take in the four points of the compass. I do not believe there is much danger of stenosis.

A Case of Gangrene of the Cecum in a Newborn Infant was reported by DR. LUCIUS A. WING, New York City. (For original article, see p. 510.)

DISCUSSION

DR. H. O. PANTZER, INDIANAPOLIS, IND.—The case described by Dr. Wing represents an extreme degree of the type of anatomic deformity which in my observation prevails in more than 90 per cent of all cases of appendicitis that

come to operation, irregularities, which dislocate, constrict, twist or angulate variously the appendix, cecum, and adjacent ileal loop. These abnormalities, I deduce, are primarily owing to faulty application during fetal growth of the peritoneum to these organs. The parts thus afflicted are disturbed at once in their physiology, and in time—being *loci minoris resistentiae*—they become the seat of infection. If at operation the appendix alone is removed and no attention is given to these constricting bands, the patient may make a good surgical recovery, yet continue to have the symptomatic distress of the preoperative period. In my appendicitis operations, I have bestowed attention to these peritoneal constrictions for more than twenty-five years, and as a consequence have found relatively few cases that continued the symptomatic disturbances in these parts.

Moreover, these anatomic irregularities can be recognized in the adult with palpation, practiced as do the blind palpate. A dislocated, angulated, compressed, widened or thickened, and tender cecum, and an angulated, thickened, tender near ileal loop, can be made out distinctly by such procedure. And, what is of paramount interest, when such conditions are found, evidence of their existence since birth is obtainable, namely 19 out of 20 times, when I ask the mother of such a person, did this child cry the first year, the response will come, "Yes, right from the first day, and through a long year." Furthermore, asking the patient: "Has there been suffering—such as fugitive colic, tenderness, distention in these parts, off and on through the years?" will oftenest bring an affirmative answer. The essence of all this: let us look for evidence of such conditions in the infant, and where found, resort to operation during the first year of infantile life when the operation would entail only the snipping of a few peritoneal bands, here and there. This procedure *then* relieves not only suffering at once, but also obviates the suffering through long years which yet may eventuate ultimately in the crises of an acute appendicitis, intestinal obstruction, malignancy, etc.

DR. WING (closing).—Some pediatricians have discovered through radiographic studies that there is considerable variation to be found in the conformation of the intestine.

My idea in reporting this case was that apparently this type of lesion is very rare. I have seen about a half dozen cases of imperforate portions of the intestinal canal. The difficulty always is with infants that before the diagnosis is arrived at the infant has developed a peritonitis and there is very little to be done.

A paper on **Extrameatal Prolapse of the Urethra** was read by DR. W. T. DANNREUTHER, New York City. See page 468.)

DISCUSSION

DR. HERMAN E. HAYD, BUFFALO, N. Y.—I have never seen such a marked extrusion as in this case, but I am sure we have all encountered the lesser degrees. Unless the condition were marked, it seems to me that it would be very rarely necessary to employ this very ingenious surgical procedure which has been shown.

I used to treat the condition by touching the mucous membrane with chromic acid on a wire, just as we used to treat a slightly hypertrophied condition of the mucous membrane of the nose. That was not satisfactory because the acid ran and therefore produced a good deal more reaction than was necessary. The last few years I have been applying, and with a great deal of satisfaction, the electric wire. It seems to me that an operation of this character, if it be used frequently will result in strictures.

DR. DANNREUTHER (closing).—We need not worry about subsequent stricture in these cases because the stroma is not involved; it is the mucosa only that is prolapsed. I believe that it is wise to operate early on acute cases because of the

tendency to thrombosis. In this specimen particularly, the histopathology was enlightening and impressed upon me the necessity of removing these thrombi. With regard to lesions of the chronic type, which are insidious in onset and tolerated by the patient for some time, I agree that conservative measures should be tried before resorting to radical treatment.

DR. E. P. SLOAN, BLOOMINGTON, ILL., read a paper on **Duodenal Ulcer from Partial Obstruction at the Duodenojejunal Junction**. (See page 492.)

DISCUSSION

DR. WM. SEAMAN BAINBRIDGE, NEW YORK CITY.—Cases with distinct kinking at the duodenojejunal junction are not very rare but, in spite of this fact, I believe we fail to recognize this condition as often as we should. This, doubtless, is due to the fact that we examine our patients in a prone position, and it is impossible fully to study anatomy, on either the living or dead, with the individual in this position. If it were always possible for us to visualize the patient upright, naturally, we should be able to form a mental image of the many kinks and angles which are to be found associated with the intestinal tract. We could, also, be able to separate better those which are normal and those which may cause symptoms.

(To be continued.)

OBSTETRICAL SOCIETY OF PHILADELPHIA

STATED MEETING OF MAY 7, 1925

THE PRESIDENT, DR. BROOKE M. ANSPACH, IN THE CHAIR

Symposium on the Obstetric Forceps

DR. WM. E. STUDDIFORD OF NEW YORK (by invitation) demonstrated the instrument of **Barton**, of Plattsburg, N. Y.

DR. RICHARD C. NORRIS described the **Dewees Forceps**, DR. E. A. SCHUMANN, the **Kielland Forceps**, and DR. E. B. PIPER a **Special Instrument Designed for Use on the Aftercoming Head**.

Dr. Norris spoke as follows:

With the ever increasing popularity, usefulness and safety of cesarean section and the effort to substitute routine version for natural delivery, together with the widespread use of pituitrin in delayed labor, it would seem that the forceps would in the future run some chance of being relegated to the obstetric garret. In the past this instrument, unwisely and destructively used oftentimes, has nevertheless been a blessing to countless women and unborn children. Wisdom can only follow knowledge and experience and it seems fitting that our Society should give an evening to a discussion of the old and well chrystallized principles of the obstetric forceps and a review of the newer ideas and instruments that have appeared in recent years.

By way of introducing the topic of forceps deliveries may I stress the particular dangers to the mother. The modern method of "protecting the perineum" to use the old phrase, has placed in our hands the operation of episiotomy, which I believe

should be used in almost all primiparae and most multiparae whose previous lacerations have been repaired. The central operation, is the one of choice in my hands, incising from a point where one feels the ridge of the constriction on the posterior vaginal wall, down to the sphincter, manually dilating the sphincter in many cases and protecting it always with a temporary figure of eight stitch through its anterior margin. This opening of the door and securing a very slow exit for the visitor, and appropriate closure is salutary to all parties concerned and examination of the patient after a month or two rewards one for his temerity. Not so, however, with what I shall call the upper pelvic diaphragm, after one has unwisely resorted to his forceps too soon. The vesicouterine and uterosacral ligaments, the cervix, bases of the broad ligaments and of the bladder, and the upper third of the vagina, cannot be handled so deftly by any procedure at our command save only cesarean section. Dührssen's vaginal hysterotomy was a step in this direction but its difficulties and dangers prevented its popularity. As gynecologists we know that extensive damage to this upper pelvic diaphragm, cannot be repaired perfectly by any operation yet devised. In view of this fact, we must realize that no forceps can be invented that will dispel this limitation to its use. Until some one is bold enough and skillful enough to open a door through this upper plane for the first step in the exit of the child, and close the door with the same facility and success as attends the passage through the lower perineal plane, there is but one resource,—preparatory dilatation, safely, slowly, intermittently and with obstetric patience, which is the *nth* degree of that quality so rare in these days. In obstetric practice I find the necessary degree of patience can best be attained by watching a clock which I think should have a prominent place in the equipment for every forceps delivery. This is a convenient means to time the intermittent duration of tractions and release of compression and even the experienced operator will find this precaution a salutary check upon his speed. Since 1877 when Tarnier presented his final axis traction model for high arrest of the head, the value of the axis traction principle has generally been acknowledged and in recent years most obstetricians utilize this principle in all forceps deliveries up to the moment when the mechanism of labor requires the final movement of extension of the head over the perineum and through the vulva. As time passed and major degrees of pelvic obstructions were recognized in advance of labor and treated by the improved cesarean section, the dangerous features of the Tarnier instrument to the child—the too close approximation of the blades and their tips, and their great power of compression and consequent injury to the head, were recognized. Major disproportion was discovered before the onset of labor and no attempts were made to use forceps for such cases. From that day the popularity of Tarnier's forceps began to wane. The value of the principle of axis traction, however, remained and the application of that principle to all types of forceps became popular. It was during this period that Dewees, after several years of concentrated study of physics and dynamics as applied to the obstetric forceps, gave up his practice and became a peripatetic and somewhat pathetic figure, as he visited various parts of the country in his efforts to have his work appreciated. He once came to see me and the inventor's enthusiasm had so possessed him and my conservative principles had so possessed me, that my reaction to his visit was to utterly fail to appreciate the value of his instrument. Several years after the visit his death occurred before his work or his forceps had received recognition and his forceps had brought him only disappointment. Believing, as I do, in the unquestioned advantage of an axis traction instrument in all forceps deliveries, Dewees forceps soon demonstrated its great advantages. The shape of the blades, the cephalic and the pelvic curves, their generous grasp of the head with a minimum amount of compression, the length of the instrument,—ample for all deliveries except the very high arrest of the head which itself speaks against an attempt at forceps delivery,—the evident

utilization of accurate axis traction, which we can feel and later see as the delivery advances,—all these qualities convinced me of its great value. Besides this, I soon learned in delivering arrested posterior occiput, that the instrument was especially valuable to favor flexion of the head, so essential in these cases. The tips of the blades are placed well back on the occiput, the handles being carried upward and toward the patient's opposite thigh. The forceps is then held in this position of elevation with the left hand while the right hand makes the traction on the handle bar. During this traction as the head descends, the tips of the blades will cause the occiput especially to be drawn downward and increase the flexion. When the head is well flexed, as shown by palpating the posterior fontanelle, has reached the pelvic floor and is beginning its anterior rotation,—but not until then,—the traction handle is loosened at its attachment, enough to swing to the median line. Traction is now made in the median line, directly outward, and the left hand upon the forceps handles gently sweep them intermittently through the arc of the circle that secures a slow and safe Scanzoni anterior rotation of the occiput. The use of Dewees forceps in this manner in my hands has given me greater satisfaction in the delivery of occiput posterior positions, than any other instrument I have ever employed and adds distinctly to its value. With a year's satisfactory experience with the Kielland forceps, for relatively high transverse arrest of the head, I feel that the instruments of Dewees and of Kielland, have made the Tarnier instrument, obsolescent in recent years, now obsolete, and I am convinced that skillful forceps deliveries with one or the other of these two types of instrument in appropriate cases, will continue to express in the highest degree the artistic accomplishment of the well trained obstetrician.

With the surgical environment of hospital obstetrics, after the head has dilated the upper pelvic diaphragm and the upper third of the vagina, the routine use of the forceps and episiotomy, to shorten labor, diminish the suffering of the mother and conserve the best interests of the infant, far surpass, in my judgment, the much extolled routine use of version, which, as practiced today, attempts delivery through an insufficiently dilated upper pelvic diaphragm.

DR. EDWARD A. SCHUMANN presented his **Observations Upon the Use of the Kielland Forceps.**

The forceps invented by Professor Kielland embody a wide deviation from the models in common use in that they were conceived for use primarily as rotators and flexors, the element of traction being a secondary consideration.

The Kielland forceps possess three distinctive features: there is no pelvic curve, the blades forming an almost straight line with the handles although made with a slight offset, in a somewhat bayonet shape; the lock is a sliding one, permitting the blades to be applied at different levels upon a head in marked asynclitism and the handles are long and slender to prevent too vigorous traction.

A great deal of controversy has arisen regarding these forceps, one group of obstetricians advocating their use to the exclusion of all other models while another element of the profession vehemently denies any possible advantage in the new design. This conflict has waged with great fury in Vienna where violent differences of opinion are expressed both in debate and in the literature.

As is usual in such circumstances the views of the inventor of the forceps are entirely ignored and his indications for their use are not considered.

Inasmuch as the deviser of a new instrument is presumably the person best qualified to speak upon its advantages and limitations, I have consulted Kielland's original paper for instruction and in my own practice have adhered rigidly to his technic and indications for its use.

The title of the paper in question, at once explains the purpose of the forceps, "The Application of the Forceps to the Unrotated Head with a Description of a New Instrument and a New Method of Application." (Kielland, Ch., *Monatschr. f. Geburtsh. u. Gyn.*, 1916, xliii, p. 48.)

The principal indication for the employment of this instrument, then, is a head arrested high in the pelvis and engaged in the transverse diameter of the basin.

Kielland lays especial stress upon the necessity for absolutely accurate diagnosis as to the position of the head and goes so far as to say that his forceps are not to be used by those who are not competent to make an accurate diagnosis as to presentation.

The most noteworthy feature of the instrument and the one which most commends it is the ease with which a true application of the blades may be made to the sides of the head when the latter is arrested high in the transverse diameter of the pelvis.¹

My own experience with the instrument leads me to the following conclusions as to its value:

1. The field of usefulness is at best a small one, since the forceps were devised to facilitate the extraction of a head impacted at the pelvic inlet. Inasmuch as the whole trend of American obstetric practice is strongly opposed to delivery by forceps under these conditions, cesarean section being the procedure of choice, the opportunities for the employment of Kielland's device are sharply restricted.
2. The usual untoward results of high forceps deliveries apply for the most part to extraction by means of this instrument. Fetal intracranial hemorrhage, maternal sacroiliac relaxation and the possibility of the production of vesicovaginal fistulae, being noted with about the same degree of frequency as when the ordinary type forceps are used.
3. When, from the nature of the case, high forceps delivery offers the only means of terminating labor, the Kielland instrument is vastly preferable to any other type. Application is simple, entrance of the head into the oblique diameter of the pelvis is facilitated and fetal traumatism is minimized by its employment. Indeed, the performance of craniotomy may unquestionably be averted, in many instances.
4. The Kielland forceps is an instrument designed for use by practitioners trained in obstetric diagnosis and technic. Its substitution in general use for the ordinary axis traction types of forceps is to be strongly decried.

DISCUSSION

DR. B. C. HIRST.—Dewees brought his original model to me, which I condemned and showed him how to correct the faults. I believe I am correct in saying that everyone who used Tarnier's forceps and then tried the Dewees has discarded the Tarnier. I also believe the Barton forceps will surely supplant the Kielland forceps. If one conceives the position of the transverse head in the superior strait directed at an angle of 5° downward and backward it is at once apparent how much better grip this forceps takes than the Kielland forceps. It is also much safer.

DR. WILLIAM R. NICHOLSON.—I agree that the patient's legs should be held by the nurse or assistants, instead of using any mechanical contrivance, not only from the standpoint of the woman's subsequent comfort, but also because the application of the instrument is often greatly expedited, and the force used in delivery may often be lessened, since by a change of position of the legs under direction of the operator, appreciable increase in the various diameters of the pelvis may be obtained.

With regard to the Kielland instrument, I cannot speak from personal experience. Theoretically I can say that I do not believe that any instrument is to be advocated

¹The technic of the application is described in detail in the July, 1925 issue of this Journal.

in a primiparous woman, with the head arrested at the superior strait. This, to my mind, is a distinct step backwards. Not that it is not possible to deliver a certain percentage of these cases with instruments, but that it is not the safest and best way to do it. At the present day the safety of the cesarean operation, even after a sufficient test of labor, has been definitely demonstrated. If we open the abdomen to remove a chronically diseased appendix which will never be the cause of the woman's death, even if it is not removed, why should we not open the abdomen to remove a living baby? In other words, I believe that the purpose for which these instruments were devised is an illegitimate indication for their use, and I have no question that if enough interest is excited in the minds of the general practitioner, the use of these instruments will result in unfortunate sequella, both to the mother and baby.

The modification of these instruments, the Barton forceps, as shown here tonight, decidedly appeals to me, if they are to be used only after the head has well entered the pelvic cavity. This, to my mind, is a differential point as regards the use of any form of forceps. I can readily understand that with a transverse head in the pelvis, this hinged forceps may well be a distinct addition to armamentarium. My own particular preference, up to this time, is the Dewees instrument, as it is the safest instrument for the baby, in any part of the birth canal, between the brim and the perineum.

I believe that this Society should definitely go on record as warning the general profession that the use of the obstetrical forceps before the head has passed the brim, is bad obstetrics, unless the case has been neglected before being seen, and any abdominal operation is therefore contraindicated. In other words, I personally feel that forceps at the brim is not to be considered as an alternate to cesarean section, but as an alternate to craniotomy.

DR. JOHN A. MCGLINN.—I confess, that with experience, I use forceps very much less than I formerly did. The majority of cases are difficult and they are trying on the individual who uses the forceps and often more trying on the patient and baby. We are so apt to use forceps where forceps should not be used, and more often to use forceps before the time approaches for their use. Simply because the woman is in labor for a comparatively long period of time does not necessarily mean, that in the interest of the woman or baby, she must be delivered by the use of forceps. Twilight sleep has showed that many cases can be saved from forceps by putting the woman to sleep, giving her rest, and allowing normal forces of labor to come into action again. So often we are called to deliver women before adequate dilatation of the cervix. I find now the majority of men have learned their lesson and there is not the great demand for forceps application as formerly. The Kielland I think is an advance on the Dewees. It seems to me that from the practical standpoint, as far as forceps are concerned, the difficulty in their use by the average doctor is that he knows nothing about the mechanism of labor.

DR. WILLIAM E. PARKE.—Every one who has used Kielland forceps when properly applied knows that the handles press far back on the perineum. The Barton forceps seem to avoid that. During the demonstration it occurred to me that one would have to have pretty strong fingers, stronger than I have at least, to press the head down. I know the amount of haul one puts on Kielland, or any forceps, and in order to get pull in the direction of the axis of the inlet it would seem to me to require a great deal of strength in the fingers.

DR. STUDDIFORD (closing).—I have used the Dewees forceps with a great deal of success. I think there is no better forceps than the old Simpson forceps. It has never been equaled by any forceps I know of and the axis traction forceps of Dewees has added a great deal to its value. Now we have to use the new Barton

forceps in that type of women that is increasing I think in frequency, rather short, with heavy pelvic bones, with a bad inclination of the promontory that you could not reach if you had your whole hand in. They are apt to rupture their membrane early. They have weak first stage pains, with slow dilatation of cervix, usually with a great deal of pressure on the anterior wall and the head partially engages and sticks. One trouble with these cases is the fact that they are unable to "push the head around the corner" and take up all the room that they have in their pelvis, and the Dewees and Kielland forceps by their traction, which necessarily must be downward and against anterior wall, fails to take up that room. With the Barton forceps, if you shift position of the head so that the sagittal suture is directly in the axis, the head drops into the cavity. If you cannot do it that way you better take your forceps off and do something else.

DR. RICHARD C. NORRIS.—I claim that the Dewees instrument is not to be used in competition with either the Kielland or Barton forceps. It is not meant for high transverse arrest of the head. It is to be used for the ordinary mid and low forceps operations and is of especial value in posterior occiput positions. In using the Kielland forceps you must pull directly downward and that means you are pushing the handles against the perineum and anus. This is so inconvenient and so dangerous from the standpoint of contamination of fingers and instrument, that I had my head nurse construct a rubber apron so that this part of the forceps and one's hands do not come in contact with the anus. This seems to be a disadvantage as compared with the Barton forceps which has the handle away from the anus and perineum. To effect delivery with the Barton forceps, an axis traction push is applied; I believe that is the principle of this forceps' success. With the Kielland instrument an axis *pull* is attempted. With the former you push the head back into the hollow of the sacrum. As soon as I saw the Barton forceps I could see its probable advantages over the Kielland forceps, if one can push hard enough to bring the head into the pelvic cavity. Dr. Schumann did not bring out that the Kielland instrument has a pelvic curve and the rule in using Kielland's forceps is to have the pelvic curve toward the occiput. To get the pelvic curve in the right direction you must remember that the small button on each blade locates for you the direction of the pelvic curve. Also when applying the second blade one must do so as to permit locking of the blades. If the occiput is towards the right you must have the buttons towards the right and *vice versa*. The anterior blade will then be the one that goes behind the symphysis. The value of the Kielland and of the Barton instrument too, is in the cephalic application. Any compression you make on the child's skull is where you want it. If you tear the mucous membrane away from its attachments by violence, no matter what forceps you use, the patient is injured. Now there is no question in my mind that this instrument replaces Tarnier's instrument entirely, and theoretically I can see how the Barton forceps with its axis push should be even more efficient than the Kielland. As to forceps on the aftercoming head, I agree with Dr. Piper. Why not routinely save effort and injury to the child and deliver with forceps the aftercoming head? I believe forceps to the aftercoming head would prevent cervical, spinal and other injuries. It would be important to the routine versionists to have a good forceps built for the purpose of getting out of difficulty in extracting the head in some of the miscalculated Potter's routine versions. I don't see why in all aftercoming heads there should not be an instrument at hand to gently extract the head over the perineum after a median episiotomy in primiparae with rigid outlets.

JOINT MEETING OF THE OBSTETRICAL SOCIETY OF
PHILADELPHIA AND THE PHILADELPHIA
PEDIATRIC SOCIETY

November 10, 1925

DR. P. BROOKE BLAND read a paper entitled **Injuries to the Infant During Delivery.** (See page 477.)

DISCUSSION

DR. RALPH M. TYSON.—Recently I had occasion to see two very interesting cases. One was that of a child born at home. The labor was sudden of onset and the mother was standing erect when the child was born. The baby dropped to the floor with sufficient force to tear the cord. Bleeding from the cord was small in amount. The baby was brought to the hospital later with definite symptoms of intracranial hemorrhage. Ocular symptoms were present, indicating some injury, possibly at the base of the brain. There was also hemorrhage into the vault of the pharynx. The x-ray picture of the skull was negative for fracture. A similar case, but without the history of injury, was that of a baby who developed symptoms and signs of cerebral hemorrhage when two weeks old. The x-ray picture in this case showed a definite fracture of the base of the skull.

DR. NORRIS W. VAUX.—As regards injury to the after-coming head in breech cases, we no longer extract the head by traction on the mouth but use a special forceps devised by Dr. E. B. Piper and have seen no brachial or tentorial injuries since.

DR. EDWARD A. SCHUMANN.—This comprehensive analysis of injuries to the newborn leads naturally to the question of what is to be done to prevent such injuries in the future. The delivery of a baby with a cranial injury is an indictment, not of the particular physician, but of the entire guild of obstetricians, because I feel that our teachings in regard to birth passages are entirely faulty. McColls in the early part of the nineteenth century described the pelvimeter, and if the measurements conform to a certain standard, we assume that they will probably permit the passage of the child without injury. Every obstetrician can recall numerous instances where this was not true, owing to some minor degrees of disproportion or variation in the molding of the child's head. Have we anything to substitute for pelvimetry? Nothing, as yet. It is my belief that with x-ray diagnosis, the possibly somewhat cumbersome plan of determining mensuration of pelvis and fetal head may possibly offer a solution.

DR. PHILIP F. WILLIAMS read a paper entitled **Vulvovaginitis in Infants and Young Children.** (See page 487.)

DISCUSSION

DR. CAMILLE J. STAMM.—Hospital epidemics are serious, and an epidemic of gonorrhea among newborn infants in a maternity hospital is especially so. During the months of August and September and the first ten days of October,

1924, there were delivered in the Jewish Maternity Hospital, 232 women. About the third week in August, several of the babies developed fever and a slight rash. A day or two later there was swelling of one or more joints.

We immediately tried to determine the cause. All sorts of local applications were used in the treatment of these diseased joints but were apparently of no avail; some joints were incised, smears taken, and staphylococci reported; others were aspirated and smears taken and staphylococci reported. Then other cases appeared at our postnatal clinic.

We tried to determine the source of the infection. Blood cultures were taken from joints, and by a process of elimination, a pure gonococcus was obtained. Vaginitis developed among some of the female infants.

We sent our social workers out to see what had happened, and by the time we got through we had collected in all 68 cases of gonorrhea among the infants. We had been using a Ziegler clamp in the hospital on the cord and we thought probably the clamp was the means of carrying the infection. We cultured the clamps and found nothing. We then discontinued using the nursery, and all other infants were placed in another nursery and all clothing, bed linen, etc., used in the nursery were sterilized. From that time infection ceased.

We then believed that someone in our midst was infected and investigated further, finally convincing the nursing force in the hospital that it was absolutely essential that we find the source of this infection. Smears from all the female nurses and help in the house were negative, except from one colored woman employed in the laundry. While this was a possible source we could not be sure, because at the same time we had two women in the house who were having a rather stormy time; while not really septic, they were not running the kind of temperature our patients usually run. They were private patients, and we did not feel justified in investigating them as if they had been ward patients. The doctor in charge assured us there was no neisserian infection. We took his word for it.

During this epidemic every joint in the body was involved: toes, fingers, wrists, ankles, knees, elbows, shoulder joints, hips, and spine. One child showed a record of nine joints involved at one time. There were however, a large number of cases of vaginitis which failed to show any further complications. We had proctitis complicated by ischiorectal abscess, and one child, delivered by cesarean section, was unfortunate enough to have gonorrheal proctitis, later developing a hip joint complication.

It was definitely decided that the hospital should be closed; that no more women should be admitted; that we should bring back all of the infected babies whose mothers were willing to bring them, and that we should treat them in our own institution.

In a survey 232 homes were visited and 68 infected babies found. In the case where the lower genital tract was infected all known remedies were used and the result was the same. We made vaccines. We had complement-fixation tests to confirm the fact that it was really a gonorrheal infection, but the real work was done from October 8, 1924 to about the first week of February, 1925. We were closed during the entire period and did nothing but take care of these sick infants.

When we thought the babies had reached such a stage that it was better to treat them in the dispensary, rather than in the hospital, we discharged them and they were sent to Mount Sinai Hospital, where they were treated with electricity and orthopedic appliances under the direction of Dr. Cooperman. We employ to this day a nurse who does nothing else but visit the homes of these babies to see how they are getting along.

We had two cases of ophthalmia; the one is blind in one eye, and the other made a complete recovery. There were 27 males and 41 females infected. Proctitis occurred in 7 males and 2 females; of the male children, 7 cases were complicated by ischiorectal abscesses; the females had none. Of uncomplicated vaginitis we had 10 cases; of complicated, 30. At the present time 23 of these are clinically negative. There was one premature child with gonorrheal infection; it died. Also, there was the child that I mentioned before with nine joints involved, plus vaginitis and spine complications, who died of pneumonia at the Philadelphia General Hospital.

Joints were involved as follows: Shoulder joint—male 6, female 6; elbow—male 5, female 5; wrists—male 9, female 14; fingers—male 5, female 7; hips—male 6, female 6; knees—male 12, female 12; ankles—male 6, female 11; toes—male 3, female 7; spine—female 3; ophthalmia—male 1, female 1. Cases under treatment—male 2, female 11; under observation—male 9, female 15; unimproved—female 3.

After we closed the hospital to treat these babies, we had the mothers come back to nurse them; we fed the mothers and paid their carfare to and from the hospital, and during the four and a half months that we were closed, we spent nineteen thousand dollars. That is what that one particular epidemic cost us in dollars and cents. When we discharged the children we cleaned the institution from top to bottom, scrubbed the walls, repaired the plaster, and painted the entire place.

When we were ready to open we made some new rules, hoping to prevent future outbreaks. We found only one thing we could do; insist that every patient admitted to the hospital for delivery have urethral, cervical and vaginal smears taken; that the smears be examined by our pathologist, and that said smears not be taken before the eighth month.

DR. CHARLES MAZER.—As to vulvovaginitis in children, I wish to give my personal experience, covering a period of nine years in active gynecologic practice.

First, I wish to emphasize the fallacy of laying too much stress on a negative smear. During the first two or three weeks of the infection, we get the characteristic intracellular organisms. Following the acute stage of the disease, we are rarely able to demonstrate the gonococcus in the vaginal smears procured by the usual methods. A larger number of positive smears during the chronic stage are obtained when the vagina is distended with sterile water by means of the jumbo syringe and the washings, thus obtained by aspiration, are examined after sedimentation.

To illustrate the fallacy of depending on negative smears, I shall cite the case of a woman whose two children were treated in the gynecologic clinic of the Mt. Sinai Hospital for vulvovaginitis. After many weeks of probation, the children were discharged as cured. Later on the mother brought one of the children to the hospital for a tonsillectomy. She held a poorly corked bottle of the child's urine in her hand when someone hit her elbow, and a drop of the urine entered her eye. Within twenty-four hours she developed a virulent gonorrheal ophthalmia. Enucleation of that eye was performed within two weeks after the onset of the infection.

We do not regard the repeated absence of gonococcus in the smears as a cure. We search for pus cells and attach great importance to the clinical condition of the affected parts.

The usual method of instilling argyrol under ordinary pressure by means of the medicine dropper is futile. The method used by Dr. Wachs and the speaker is as follows: The vagina is washed with a jumbo syringe of a two or three

dram capacity until the mucosa is free from secretions. An antiseptic solution is then instilled under pressure, whether it is argyrol, Dakin's oil or acraflavine mattering very little. The child is put in the Trendelenburg position during this procedure. The important thing is that these antiseptics be brought into contact with the vaginal mucosa that was primarily freed of tenacious secretions.

A considerable number of these patients were permanently cured by direct application of silver nitrate and tincture of iodine to the cervix through a Kelly cystoscope. Very frequently the cervical infection is responsible for the chronicity of the condition.

A DELIVERY ROOM MIRROR

BY HOWARD F. KANE, A.B., M.D., F.A.C.S., WASHINGTON, D. C.

FOR the purpose of keeping the anesthetist informed as to the progress of the perineal portion of the second stage of labor, the use of a mirror suggested itself.

The mirror is placed at the foot of the delivery table and adjusted to a convenient angle. This permits the anesthetist to watch the effect of each uterine contraction and to administer the anesthetic according to the need of the moment. The view of the vulva and perineum is improved by placing a douche pan under the patient's buttocks as soon as the perineum begins to bulge.

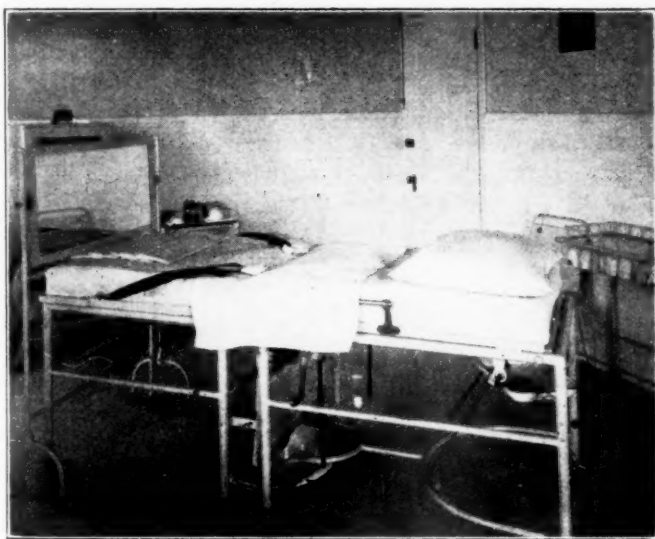


Fig. 1.

While the primary object of the mirror is to aid the anesthetist, it has been found to be of value in demonstrating deliveries to students. The students stand at the head of the table, away from the sterile area, out of sight of the patient, and obtain a perfect view of the delivery.

In several hospitals the apparatus has been improvised by hanging the mirror from the top of a one-panel screen, with a strip of muslin stretched behind the lower edge of the glass. More satisfactory, however, is the mirror with a stand.

The accompanying illustration shows the mirror as used in the National Homeopathic Hospital of Washington, D. C. Experience has shown that the view is less likely to be obstructed if the lower edge of the mirror is about eight inches higher than the level of the table.

1801 EYE STREET, N. W.

Department of Reviews and Abstracts

CONDUCTED BY HUGO EHRENFEST, M.D., ASSOCIATE EDITOR

Collective Review

A REVIEW OF THE GYNECOLOGIC LITERATURE OF 1925

BY SYDNEY S. SCHOCHET, M.D., CHICAGO
(Attending Gynecologist St. Bernards Hospital)

AND

JULIUS E. LACKNER, M.D., CHICAGO

THE literature of gynecology of the past year, for the most part, consists of evaluations of the methods of treatment of carcinoma; of an extensive consideration of adenomatosis; of discussions of the time honored corrections of displacements with profusely illustrated technical descriptions; of analyses of the very little understood functions of menstruation; and of learned expositions on the relationships of the endocrine system to gynecology, or some detailed consideration of the many biochemic tests, which generally overshoot the mark as far as their real value in gynecic therapy is concerned.

In offering our critical analysis of the literature of 1925, we do so with much embarrassment, and with the fear that we have not accepted freely the results of empiric observations. And yet it is not necessary to dwell on the fact that new paths have been blazed as the result of empiric hypotheses as well as carefully detailed planned scientific investigations. It is necessary, however, to argue in favor of strict limitations as to conclusions, because conflicting theories of various investigators have led to skepticism, even to the point of doubting. This is essentially true of our knowledge concerning hormones. There seems to be current a good deal of misconception regarding specificity of hormone action in menstruation. Though we do not hesitate to discuss "hormones," only two endocrines are known chemically; namely, thyroxin and epinephrin; and there are physiologists who do not consider that epinephrin has a hormone function. Many of our modern fictions in physiology about *specific hormone action* have reechoed a widespread belief in their presence in certain pelvic organs. For ourselves, we doubt of their existence. The review in the biochemic fields makes us think of a very interesting novel, *Arrowsmith*, by Sinclair Lewis. It is time, therefore, without losing sight of the advances in biochemistry, to bestow more adequate attention on the homely everyday problems in gynecology.

GENERAL PROBLEMS

Fewer authors have written on the sedimentation test as a diagnostic aid in gynecology during the past year. Let us reflect. Although

the earlier observations on these phenomena were called to our attention by John Hunter in 1794, and in the earlier works of Galen, the last word about the many causes of precipitation of the erythrocytes has not as yet been spoken. Baer and Reis⁵ have carefully analyzed the value of this test in pregnancy and in pelvic lesions. They conclude that it is apparently of no value in the early diagnosis of pregnancy, but see it as a useful test to determine pelvic pathology, and the virulence of infections, and they consider it a more delicate prognostic index than either the leucocytic or temperature curve.

Ward¹¹¹ is of the opinion that the study of medicine in the future will be the study of biologic sciences, and interprets the gynecic art as more than the mere cutting and sewing of the pelvic organs. It should include sociologic studies with regard to a woman's fitness for marriage and childbearing, her sexual psychology, and her degeneracies under modern social conditions.

While it is true that some of the modern theories of electricity are of a merely speculative character, yet they serve as a working basis to explain phenomena observed in the therapeutic use of electricity. Kolischer⁵⁸ in a very interesting and highly scientific paper has elucidated some of the modern theories in the science of electricity. A careful study of this paper will prove of material aid to many roentgenologists.

Schochet⁹⁸ reports the observation of distinctly different groups represented in the blood of mother and child in a normal obstetric case. Such findings disprove one of the many theories of the etiology of eclampsia.

Endoscopy of the abdomen, described by Nadeau and Kampmeier,⁸¹ belongs to some of the novel innovations in diagnosis. While such experiments are interesting from an academic viewpoint, it is doubtful whether they should be advocated to supplant the more exact means of diagnosis or exploratory laparotomy. This instrument necessarily limits the extent of exploration within the abdomen, and does not prevent trauma or preclude the possibility of infection or adhesions.

Drainage of the thoracic duct has been advocated by McGuire⁷² in the treatment of peritonitis. It does not appear that procedures of this type are on sound bases, for numerous organisms undoubtedly enter the blood stream via the blood vessels as well as the lymphatics.

Kovaes⁶⁰ reports temporary sterility in 56.3 per cent of white rats after the injection of placental tissue. The author believes that absorption of some component of the placenta may account for the temporary sterility following abortions. Curtis²⁶ is of the opinion that focal infections with a tendency towards exacerbation are important causes of otherwise inexplicable spontaneous abortions.

Clinical results of chemotherapy are not always as favorable as reported by certain investigators. Even repeated intravenous injections of salvarsan do not necessarily rid the body of spirochetal infections. Robertson⁹¹ advocates intravenous injections of freshly prepared eusol in the treatment of severe septic states.

Täkäts¹⁰⁷ gives a very exhaustive study of the evolution of chemotherapy with brilliant results from the use of a substance called rivanol. (2 aethoxy - 6.9 diamino-aeridine.)

Winter¹¹⁷ suggests that a routine bacteriologic examination should be made of the vaginal flora in all gynecologic cases. In this way a more careful prognosis can be given. It should be borne in mind, how-

ever, that the presence of organisms, even of the virulent streptococcus, does not necessarily mean an active or latent infection in the host.

Clark¹⁸ reviews the many conditions which render patients poor risks in pelvic surgery. Anesthesia in this respect does not play so important a rôle as a septic or toxic state of the patient. Unnecessary surgical intervention is today less often done on the mobile retroverted uterus, the simple lacerated cervix, and the chronically neurotic individual than formerly. However, one should not gain the impression that all fads have been replaced by sane recognized forms of treatment. Crainicianu²² still advises organotherapy for the so-called empiric hyperfunction of the ovary.

Jaschke⁵³ states that the results of psychotherapy in gynecology often are unsatisfactory, and that when wrongly practiced the method may be harmful. It is evident that no solution seems near at hand for the cure of the large number of unstable neurotic women whom the gynecologists meet in everyday routine practice.

Lynch⁶⁵ reviews 608 gynecologic cases. In 48 per cent of these, sacral and sacrolumbar backaches were present. Of these, 87 per cent were cured of backache by gynecologic operations. From these statistics it appears that in a certain percentage of cases a backache must be ascribed to gynecologic pathology.

Dickinson and Pierson³¹ bring to our attention interesting facts, not generally discussed. The average age of autoerotic practices among college women was found to be thirty-seven years with the largest group at thirty years. Two-thirds of 1183 unmarried college women seemingly practiced masturbation. Of this large series, 42 per cent began for the most part between five and eleven years of age. One-third of this group reported indulgence once or twice a month.

ANESTHETICS

For aged patients, when a general anesthetic is indicated, MacNider⁶⁷ suggests that it should be preceded by a diet rich in carbohydrates and with the judicious use of sodium bicarbonate in order to maintain a normal acid base equilibrium of the blood during the anesthetic. Mandelbaum⁶⁸ advises intraspinal anesthesia for elderly women, but favors a general anesthetic for younger patients.

VAGINA AND CERVIX

Robinson⁹² presents positive experimental evidence that potassium iodide and sodium salicylate when placed in the vagina are rapidly absorbed, and excreted in the urine.

Szenes¹⁰⁶ finds that calcium salts increase the calcium content of the genital secretions.

A positive etiologic diagnosis of vaginal cysts cannot be made from the histologic picture alone, unless the location of the cyst is considered. Miles⁷⁴ reports five cases of cyst of the vagina, of which one was an inclusion cyst of the vaginal mucosa and four were cysts of Gärtner's ducts. Wharton¹¹⁵ reviews thirty-one authentic cases of tuberculosis of the vagina, and adds two new observations from a series of 30,000 gynecologic cases in the Johns Hopkins Hospital. He concludes that the medical treatment gives the best end-results.

For the treatment of gonorrheal Bartholinitis (not abscessed) Gouin and Aoustin⁴⁷ inject a few drops of a 10 per cent solution of zinc chloride into the gland. We do not believe that this dangerous caustic

should be injected into the tissues, nor does it seem logical, that it is at all feasible to obtain sterilization of the gland. Gordon⁴⁶ reports a case of primary tuberculosis of Bartholin's gland. Only three other cases of this sort have been recorded.

Arnoldi and Warnekros³ emphasize an old empiric clinical observation, that patients with pruritus vulvae, whether diabetic or not, are helped by a low carbohydrate antidiabetic diet.

Sturmdorf¹⁰⁵ is opposed to the postoperative use of the indwelling catheter in cases of vesicovaginal fistulae for it does not keep the bladder empty. Watkins¹¹³ has advised a thorough dissection of the anterior vaginal wall for closure of vesicovaginal fistulae. He claims that a urethrocele is usually associated with a cystocele as the result of a transverse tear of the upper part of the vesicovaginal fascia. Successful repair requires transverse suture at the site of the injury and care in bringing firm tissue over the base of the urethra. In large vesicovaginal fistulae in which the capacity of the bladder is reduced, Miller⁷⁶ advises high colpoceleisis with supravaginal amputation of the uterus or radium sterilization. Prolapse of the culdesac of Douglas or posterior vaginal enterocoele has received little attention in the literature. It is a causative factor in the prolapse of the uterus of virgins and is often overlooked. In the more severe cases, Phaneuf⁸⁰ suggests the abdominal route for repair.

Barrett, Lash, and Pilot⁶ found streptococci present in 40 per cent of the cases of chronic infection of the cervix. Lowenstein⁶⁴ points out that *Oxyuris vermicularis* is often overlooked in the etiology of leucorrhea. He emphasizes the importance of a thorough general physical examination in the study of every case of leucorrhea, since it is not an uncommon experience to find marked leucorrhea in patients with systemic conditions, such as tuberculosis, asthenia, and chlorosis.

Hilliard Miller,⁷⁶ Carl Davis,²⁹ and Abrams¹ recommend the cautery method of treatment in endocervicitis. Blair,⁸ and Burns¹² advocate Sturmdorf's coning-out procedure for it eradicates the mucosa but conserves the cervix. Miller does not favor radium in the treatment of endocervicitis because it is slower in action, more expensive, and may cause the onset of artificial menopause. It should also be borne in mind that radiation destroys certain defensive protective bodies. Lavake⁶² reports his experience with diathermy in the treatment of endocervicitis and controls the effect of treatment by means of cervical smears. He tried the Corbus metal electrode in the cervix but was unable to discharge a single patient as cured of the infection after three months of active treatment. Young¹¹⁹ drains the cervical glands by means of intermittent aspiratory hyperemia. Jaschke,⁵² and Menge⁷³ emphasize the importance of genital hypersecretion as caused by extragenital disturbances. A purely symptomatic treatment of the fluor often does more harm than good. Castellani and Taylor¹⁶ report cases of vaginitis due to *Monilias*. These cases are frequently encountered in the Balkans, Italy, and England.

ADENOMATOSIS

Sampson's interpretation of certain cysts and adenomyomas in the pelvic organs as caused by misplaced endometrial tissue has provoked world-wide interest. This is the outstanding topic in the literature of 1925. Heaney,⁴⁹ Danforth,²⁸ Mark,⁶⁹ Lemon and Mahle⁶³ report cases of adenomas in the operative scar. Outerbridge⁸⁷ records

four cases of cystic lesions, possibly of endometrial origin, in the appendix. Sampson⁹⁵ believes that benign endometrial tissue invades and disseminates through the same channels as carcinoma. Benign endometrial tissue, just as ovarian and endometrial carcinoma, is found most often in the dependent portions of the pelvis and its natural peritoneal folds, with invasion of underlying structures. Benign endometrial tissue, like fragments of cancer, infects the field of operation. Both invade lymph vessels. Both have metastases at a distance from the primary growth. Inguinal adenometriosis⁹⁶ metastasizes through lymph vessels, extends directly along the round ligaments from peritoneal endometriosis and from endometrial tissue, escaping into uterine vessels during menstruation. Ewing,³⁴ in discussing Sampson's findings, accepts as endometrial transplants those cases in which the structure is typical, in some instances even those without endometrial stroma, especially when the clinical history indicates that some violence has been done to the endometrium or tubal mucosa which can reasonably account for a transplant or misplacement of endometrial mucosa. The clinical history is of much importance in these cases in guiding the surgeon and the pathologist in assuming that they deal with an endometrial transplant. The changes occurring in these tissues during menstruation and pregnancy appear to be unreliable evidence of their endometrial origin, but have some significance. The fact that endometrial tissue can be transplanted by mechanical means should be a warning to the gynecologist. Ewing is convinced that a large proportion of fatalities from cervical and corpus carcinoma is the result of cell dissemination produced by the surgeon. Cullen,²⁴ therefore, advises closure of the cervix and cleansing of the vagina to prevent escape of carcinoma cells during hysterectomy for corpus carcinoma. He believes that adenomyomas of the umbilicus and round ligaments are embryonic inclusions while adenomyomas of abdominal scars are transplants.

Robinson⁹² maintains that the theory of displacement no longer fills our present conception of heterotopic endometrial formations and, therefore, should be discarded. Adenomyoma is peculiar to the female and is prevalent during the period of maximal procreative function. Robinson believes that the celomic epithelium is the genetic source of all adenomyomas irrespective of location.

Oskar Frankl⁴¹ favors operative removal of adenomyomas, since x-rays and radium do not prove sufficient. In those cases where there is extensive involvement of the intestine by endometrial invasion, Sampson advises against any radical operative procedures, for in the majority of cases the endometrium undergoes retrogression.

MYOMA

Clark and Block¹⁷ advise no interference in those cases of fibroids in which there is no obvious disturbance of health. In the absence of well-defined indications for the removal of the cervix, subtotal hysterectomy is the operation of choice. At the present time myomectomy carries no higher mortality than hysterectomy and is followed by pregnancy in a certain percentage of cases. Clark and Block¹⁷ report 422 cases of uterine myomas. Their statistics show that operative treatment is becoming more popular and radiation less frequently employed. In 1922, 58.1 per cent were operated. In 1924, 70.1 per cent. Graves⁴⁸ emphasizes the value of myomectomy in the childbear-

ing period. Bonney⁹ urges a more extensive adoption of the operation of myomectomy so as to include in its scope many of the cases showing fibroids, still commonly dealt with by hysterectomy. Conservation of the uterus should be the ideal of the surgeon, whenever the organ is presumably healthy. The largest number of fibroids enucleated by Bonney at one time was sixty. The removal of so large a number of fibroids appears to us as ultraconservative. In operative cases of fibroids complicating pregnancy, one can preserve the pregnancy when the fibroid is solitary. Not long ago, large tumors and hemorrhagic uteri were removed radically with and without the removal of the adnexa. Zweifel and Veit believe that in benign conditions of the uterus, a small portion of the uterus containing endometrium should be retained. Bergsman believes that to keep uterine menstruating mucosa is just as important as to retain the internal secretory functions of the ovary.

Aschner⁴ says, if one believes that not only the internal secretions but also a normal menstrual flow are necessary for the health of women up to the time of the normal menopause, then x-rays can be discarded. In every woman where there is no vital indication for extirpation of the uterus, menstruation should be allowed to continue until the climacteric. Partial fundus resection is the best treatment. In later years there may be a recurrence of fibroids, but the clinical results obtained by continuation of menstruation overshadow the danger of the recurrence. Masson,⁷⁰ and Foucar³⁷ believe that the application of zinc chloride to the endometrium is indicated in a small percentage of cases that pass through the menopause with abnormal bleeding, not due to malignancy. This treatment produces amenorrhea and sterility, without impairment of ovarian function. Here again we question the use of zinc chloride in gynecology. It has been shown experimentally that zinc chloride is a very toxic substance when accidentally injected into the circulatory system. Its local action cannot be controlled, and it frequently destroys the deep underlying structures. Seed¹⁰⁰ reports degeneration in 13 per cent of 200 fibromyomas examined. Hyalin, myxomatous, and red degeneration, with calcification were present. Starry¹⁰⁴ reports a rare case of fatty tumor of the uterus. Only seventeen cases of lipoma and lipomyoma are recorded in the literature.

METRRORRHAGIA

In a certain percentage of metrorrhagias, according to Castano,¹⁵ hemorrhagic reactions in the endometrium are due to hormonal influences from the corpus luteum. At the present time there is no unified treatment of uterine bleeding. In the climacteric patient, Henkel⁵¹ believes, every case of bleeding should be regarded as cancer and a diagnostic curettage made, except in cases where the diagnosis of cancer is evident. Mazet⁷¹ advises digital exploration of the interior of the uterus in order to determine the cause of a climacteric hemorrhage. Pregnancy and adnexal inflammation constitute the only contraindications to intrauterine digital exploration. Kelly⁵⁵ advocates curettage in the office without anesthesia, for it is safe, speedy, and inexpensive. Gellhorn emphasizes the importance of curetting each cornu of the uterus for carcinoma and polyps, which are often situated in this location. He decries the use of intrauterine douches and antiseptics, which may cause hematometra and pyometra. The essentials in curettage are gentleness in dilatation and handling of instruments.

Rubin⁹³ emphasizes the value of the hysteroscope in diagnosing uterine causes of genital bleeding, such as submucous myoma, glandular hyperplasia, endometrial polyps, chorioepithelioma, and malignancy. The instrument may also be of value in studying the cyclic changes of the endometrium in the various stages of menstruation. We believe that too great an evaluation is placed on the uteroscope.

In the treatment of hemorrhages caused by chronic inflammation, Fuss⁴³ reports success with local methods. Morrow employs radium or hysterectomy in the therapy of arteriosclerosis of the uterus. New-comer controls hemorrhage due to general systemic conditions or to local benign growths by mild roentgen irradiation. Doub, Bolliger, and Hartman³² report irradiation sickness in a large percentage of their cases. Symptoms were alleviated by morphine and calcium lactate. Radiation therapy should be undertaken only by those who have a competent surgical knowledge, as Graves⁴⁸ emphasizes that there are certain contraindications to radiation which require the experience of a specialist for diagnosis. These are pelvic infections, retention of follicular cysts of the ovary, sloughing fibroids, submucous myomas and carcinoma of the fundus.

MALIGNANCIES

The cancer problem is the most pressing as well as the most difficult that occupies the minds of the medical world at the present time. While cancer still exercises its ravages almost uncurbed, we yet cling to the faith, that future research will reveal some means of its eradication or prevention. So long as we possess no exact clue in regard to the true nature of malignancy, we should not permit ourselves to be enslaved by arbitrary definitions, statistics, and theories of causation, or be hampered by brilliant reports of methods of therapy. The problems of cancerous growth are fundamentally identical with the problems of normal growth of tissue, and the information which sheds light upon the one type of growth will reveal the origin of the other. Cancer statistics are notoriously open to various interpretations. A lay statistician, a pathologist, or physician untrained in methods of exact statistics may draw conclusions that appear absurd. What value can be placed on such divergent reports on cancer mortality rate as 64.4 for Detroit and 152.6 for San Francisco?

Ochsner⁸⁵ considers cancer an infection and emphasizes the importance of Nuzum's infective agent, a micrococcus, as the causative factor. Coley¹⁹ believes that there are clinical evidences in favor of the extrinsic origin of cancer.

Nuzum⁸⁴ gives the results of six years bacteriologic study of breast tumors and claims to have reproduced similar lesions in the dog with repeated injections of his micrococcus.

According to an editorial in the *Journal of the American Medical Association*, the British Cancer Research¹²¹ decries the many exalted newspaper claims of discovery of the etiologic factors of cancer. Soper,¹⁰³ Director of the American Society for the Control of Cancer, deplors the claims of Nuzum. Nuzum's paper is straightforward, but unfortunately contains statements and interpretations, conjectures and opinions which carry his conclusions even farther than he intended. In fairness to Nuzum, we may state that he does not claim that cancer in human beings is caused by a bacterium. Such inferences initiate a great hidden danger of an increased deathrate from cancer, since

some physicians and many laymen might conclude that we now possess a serum or salve that cures cancer. MacCarty⁶⁶ believes that the cancer cell is an entity and he recognizes this cell in the majority of cases when fresh material is employed. This may be possible for MacCarty, but it would be dangerous practice for the average pathologist. Frankl⁴² reports eight cases of carcinoma and sarcoma simultaneously present in the uterus. He suggests that both growths originate at the same time, but it is difficult to demonstrate this. Unfortunately we are still so deeply ignorant of many important aspects of malignancy that it becomes difficult to properly evaluate the various methods of treatment. Reports and clinical observations on radium and x-ray treatment are now more numerous than in previous years. While it is true that every case of carcinoma is a study unto itself, yet much additional value could be added to these reports if a uniform classification, such as that suggested by Schmitz,⁹⁷ were followed.

Ward and Farrar¹¹² have adopted Schmitz's classification in regard to the stages of involvement, and conclude that radium application is the better procedure. The end-results are as good as with operations while the patient does not incur the risks of surgical intervention.

Smith¹⁰² advocates radium and x-ray therapy together with the Byrne cautery for early carcinoma. Pfahler⁸⁸ entertains the view that radiation offers the best chance in all stages of carcinoma. He states that we may expect 60 to 80 per cent of cures in the earliest stages. Unfortunately the majority of gynecologists have failed to obtain such brilliant results. Quigley⁹⁰ reports 69 cases treated by radiotherapy with apparent cures in 37 cases. Burnam and Neill¹¹ apply radium through the abdominal route in borderline cases of uterine cancer, and they believe this to be a more effective means of attack. Taussig¹⁰⁸ now employs 3000 to 3300 mghr. in the first treatment and four weeks later applies a second dose of from 1500 to 1800 mghr.

Schmitz⁹⁷ reports good end-results in inoperable carcinoma with measured doses of x-rays and radium. Graves⁴⁸ emphasizes the contraindication of radium in cases of carcinoma of the body of the uterus. From Döderlein's Clinic, Voltz reports the results in 755 patients treated with radium: 110 were operable cases, with 43.6 per cent cures; 130 were borderline cases with 22 per cent cures; 340 were inoperable cases with 6.7 per cent cures; 169 were hopeless cases with one cure.

References to the operative results of uterine cancer are not given, for we believe that it is the method of choice to be employed in properly selected cases.

RELATION OF BREASTS TO GENITAL ORGANS

C. Jeff Miller⁷⁵ refers to the close relationship between the breasts and genital organs. He believes that certain pathologic breast changes, cystic mastitis, etc., may be caused by pathology in the pelvis. Exploratory incision is necessary in a large majority of cases. Mohler⁷⁸ reports considerable improvement in the treatment of obstinate pelvic infections with hypodermic injections of foreign proteins.

DYSMENORRHEA

Novak⁸³ considers dysmenorrhea a neurosis, which has its roots in a previous psychic trauma. Dick³⁰ believes that many cases of dysmenorrhea are relieved by psychotherapeutic measures. Castano¹⁵ refers to a close relationship of dysmenorrhea and appendicitis. In 90

per cent of his cases of dysmenorrhea there was an associated chronic appendicitis. Miller⁷⁵ thinks that dilatation with curettage is still the commonest form of treatment and gives the largest percentage of temporary and permanent relief. In his series Miller obtained permanent relief in 40 per cent of the cases. Plastic operations on the cervix are of little value. Lanz finds that menstruation does not influence basal metabolism in healthy women, but in pathologic conditions, there is a definite rate of increase in the premenstrual period and in the last days of menstruation. At the beginning of the menses the metabolism decreases quickly and reaches its lowest rate at the beginning of the flow. Blood-sugar determinations made by Okey and Robb⁸⁶ during menstruation showed a slightly higher value than those made in the intermenstrual period. Smit¹⁰¹ says diathermy may be useful in all conditions benefited by heat; viz., dysmenorrhea, sterility due to uterine hypoplasia, and secondary sterility caused by superinvolution of the uterus.

Cotte,²⁰ and Dechaume tried decortication of the hypogastric artery with section of the presacral nerves in the treatment of rebellious dysmenorrhea, pelvic neuralgia, vaginismus, hypoplasia of the uterus of mild infective origin, clitoris crisis, metrorrhagia, and leucorrhea of ovarian origin in young girls. At the present time they resect the presacral nerves, where they pass through the peritoneum along the inner side of the last lumbar vertebra. It seems to us that too many conditions are attributed to these nerves.

STERILITY

Kennedy⁵⁷ believes that isthmospasm of the fallopian tube prevents the meeting of the ovum and the sperm, or may be the only obstruction that prevents the passage of the fertilized ovum from the tube into the uterus. Polak (in discussion of Kennedy's paper) brings out a point that seems to support such a spasmodic condition of the tubes; namely, that the Rubin test may be negative until the patient is anesthetized, when the injected gas easily passes through the tubes.

Geist and Goldberger⁴⁴ emphasize the importance of pathologic conditions in the intramural portion of the tube for sterility. Lesions may be present here with or without closure of the fimbriated extremity. With the Rubin test alone, one cannot localize the site of obstruction in the tube. Geist advises for this purpose the use of Kennedy's test, before operative measures are instituted. Vereesi¹¹⁰ employs a 40 per cent suspension of iodine in vegetable oil to procure roentgenogram tracks. Williams and Reynolds¹¹⁶ insufflate an emulsion of barium sulphate into the uterine cervix and makes roentgenograms twenty-four, forty-eight, and seventy-two hours later. The emulsion is dropped into the uterine cavity and not forced in under pressure. In the course of seventy-two hours all barium has disappeared.

Kahn⁵⁴ emphasizes the importance of pathologic conditions in the cervix in the study of sterility cases, and he believes that lesions here, more frequent than changes in the tubes, are the cause of sterility. Cervical secretions constantly blocking the canal indicate a hyperemic or inflamed condition of the cervical glands. Cervical discharge may be altered chemically by disturbances in ovarian function. Kahn advises against curettage in the treatment of primary sterility, since it frequently causes lacerations of the cervix and endometritis. Rubin⁹²

states that the fourth to the seventh day following the cessation of the menses is the ideal time for testing the patency of the tubes.

Moench⁷⁷ believes that insufflation of the tubes has a small but real therapeutic value in cases of sterility, but lays greater stress on the important rôle of cervical conditions.

In cases of infantile uteri with sterility, Castano¹⁴ advises the use of diathermy. One of twenty patients thus treated became pregnant. In cases of hypofunction from infantile development, Flatau³⁶ has resorted to the stimulation of the ovaries with small doses of roentgen irradiation. He cites 21 cases of which 12 became pregnant; 8 of these carried to full term and were delivered of healthy children. Waser^{112a} reports but one failure in 225 sterilizing interventions with the Madlener crushing method of the tube followed by ligation.

EXTRAUTERINE PREGNANCY

In a study of the leucocyte count in 150 cases of ectopic gestation, Farrar³⁵ finds that the leucocyte count increased rapidly with the escape of blood into the peritoneal cavity, but dropped quickly to normal or near the normal as the blood was absorbed or walled off by peritoneal adhesions. The fluctuating leucocytic count and the moderate elevation of temperature differentiates ectopic gestation from purulent salpingitis, as in the latter conditions, there is a more uniformly high leucocyte count and a more marked fluctuating temperature curve. When there is a hemorrhage in a tubal pregnancy case, the steadily rising leucocyte count is a better aid in diagnosis than the decrease in red blood cells or the percentage of hemoglobin. The leucocytic count to be of diagnostic value must be taken daily or hourly in critical cases. In 21 cases of tubal pregnancy Novak and Darnier⁵² were able to correlate the uterine and tubal mucosal findings. The decidual reactions in the uterus with extrauterine pregnancy were identical with that of normal gestation as long as the embryo was alive. When the embryo dies, the superficial compact part, and a considerable portion of the spongy glandular layer is cast off. The decidua is more frequently thrown off in small particles than as a large uterine cast. This is on account of degenerative and necrotic changes.

OVARY

It is difficult to estimate the true value of the various researches on ovarian function, as too few of the fundamental physiologic processes of this organ are known at the present time.

During the past year extensive investigations of the liquor folliculi have been recorded. Schochet⁹⁹ was the first to call attention to the physiologic action of the liquor folliculi in ovulation. Allen, Pratt, and Doisy² attribute a hormone action to the liquor, and have devised a means for the standardization of its action.

Robert Frank concludes that the corpus luteum, placenta, and follicle fluid contain the female sex hormone. Frank, Gustavson, Weyerts, and Frank⁴⁰ have shown that a benzene extract of circulating blood of pregnant sows produces vaginal changes in castrated rats. In another series of experiments, Frank, Kingery, and Gustavson³⁸ prove that the female sex hormone is the causative factor of puberty.

Frank and Gustavson³⁹ in a study of the chemistry of the female sex hormone conclude that it is a thermostable lipid of high molecular weight; that it is elaborated by the gestational gland, and is taken up

by the lymph and blood streams. Allen and Doisy² have shown that substances obtained from the placenta and embryonic tissue (umbilical cord) produce reactions in the rat similar to those produced by the follicular hormone. From these experimental studies it would seem logical to question the specificity of hormone action in the liquor folliculi.

Burrows and Johnston,¹³ in experiments on fat metabolism found that the liquor folliculi contains an active growth-stimulating substance, and one capable of initiating an active digestion of a foreign fat. Brouha and Simonnet¹⁰ observed that an injection of an extract of liquor folliculi prolonged the estrous cycle, but produced no changes in the mammary gland, nor were there apparent influences on gestation. Temporary inhibition of ovulation in the rabbit was obtained by Kennedy with extracts of corpus luteum. In 28 cases studied by Cotte and Vachey,²¹ they were unable to prove that the corpus luteum produces metrorrhagia and menorrhagia. They ascribe a greater importance to the sympathetic nervous system as the etiologic factor. Watrin¹⁴ reports the production of menstruation in a girl with defective menstruation by the injection of follicular fluid. The menstrual flow appeared the following day—six days before the anticipated period. Gynecologists find that menstruation frequently follows surgical procedures about the ovaries. We may suggest that accidental rupture of follicles are responsible for the flow of blood in these postoperative cases.

Tuffier and Bour¹⁰⁰ report successful results from ovarian grafts in 52 cases; in some cases the menstrual flow persisted for periods varying from five to ten years. In other cases, the ovarian grafts were followed by pregnancy with normal childbirth. Kross⁶¹ advocates ovarian grafts in patients with congenitally absent ovaries, and in cases of bilateral castration in young women on account of pus tubes.

Blair Bell⁷ reports 187 cases of ovarian grafting with an analysis of 118. Of these, menstruation occurred in 66.3 per cent. No menstruation and no menopausal symptoms were observed in 20 per cent; menopausal symptoms in 14 per cent. From these reports it seems warranted that ovarian grafting should play a more important part in future reconstructive gynecic surgery.

During the past year Sampson^{95, 96} has called attention to the important part played by endometrial transplants. The frequency of glandular elements, similar in structure and physiologic function, cannot be denied. However, before we can accept these structures as endometrial transplants, arising from the endometrium of the uterus or mucosa of the tubes, we must require more definite experimental data. While we entertain a less skeptical frame of mind as to the possibility of endometrial transplants, we cannot lose sight of their possible origin from peritoneal metaplasia. Aside from this academic discussion of the origin of endometrial transplants, Sampson⁹⁴ has convincingly proved that a certain percentage of carcinomas of the ovary take their origin from these endometrial glandular areas.

Dougal³³ reports a case of primary chorioepithelioma of the ovary. This group of tumors is of considerable importance as they occur in unmarried women. Often erroneous and embarrassing conclusions are given as to their source of origin.

Koucky⁵⁹ states that 50 per cent of dermoids of the ovary may be diagnosed by the x-ray. Gordon⁴⁶ describes an unusual case of cystic

retroperitoneal teratoma weighing 11 kilograms. Danforth²⁷ reports the finding of an unusually large bilocular pseudomucinous cyst in a patient fifteen years of age. Curtis,²⁵ Danforth,²⁷ and Schochet⁹⁹ have recorded cases of fibroma of the ovary. This type of tumor is not of frequent occurrence. Culbertson²³ describes a case of follicular ovarian cyst simulating ectopic pregnancy. This type of ovarian growth is of great clinical importance because we cannot be positive of a pre-operative diagnosis. Actinomyces is among the rare infections of the ovary reported by Helwig.⁵⁰

Many valuable and suggestive papers in this year's literature on the treatment of carcinoma with radium will be considered at a later date in a special review.

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Selected Abstracts

Abortion

Eymer, H.: *The Value of the Life of the Unborn in Obstetrics*. *Wiener Klinische Wochenschrift*, 1924, xxxvii, 946.

The author decries the laxity with which the indications for therapeutic abortion often are set. He agrees that the life of the mother is always of more value than that of the unborn but does not believe that the life of the fetus should be destroyed on account of minor ailments, such as is too readily done at the present time. He does not believe that pyelitis, struma, tumors, etc., are indications for the termination of pregnancy and he objects to the modern tendency to consider pregnancy as a complication of these various diseases. Pregnancy does not affect most diseases of the blood. In acute splenic leucemia, abortion does no good, and in the chronic form it is unnecessary. In Biermer's anemia, abortion does not help, for the patient cannot be saved in any event, and by allowing pregnancy to go on a living child may result. In diabetes mellitus abortion is not necessary since the disease may be fatal or go on to recovery whether the patient is pregnant or not. Prophylactic abortion should not be done in this disease unless acidosis is present.

Heart disease is only rarely of importance though frequently present. Jaschke found a mortality of only 1 per cent in valvular disease complicating pregnancy. Mitral stenosis, alone or in combination with other lesions, is dangerous, especially during the second stage of labor. An attempt must be made to maintain cardiac compensation, and therapeutic abortion should be performed only as a last resort in cardiac decompensation. Recurrent endocarditis and myocarditis are also of serious import, but even here the attempt should be made to carry the patient to term.

Renal disease is often observed in pregnancy but a pure nephropathy never requires an abortion which should be done only for rising blood pressure or when albuminuric retinitis threatens maternal vision. Abortion never improves or renders an otosclerosis stationary.

Basedow's disease may be a grave complication of pregnancy, but interruption of the latter is not necessarily followed by improvement. Epilepsy is not relieved by a therapeutic abortion, and the author was unable to influence in any way a case of status epilepticus in which he terminated pregnancy. Myelitis, multiple sclerosis, multiple neuritis, chorea, and tetany only rarely require abortion and then only in the most severe forms.

The author states that he has never seen a case of hyperemesis gravidarum requiring abortion. In acute yellow atrophy, abortion is usually done too late to be of any value. In tuberculosis, therapeutic abortion has no curative effect but is merely a prophylactic procedure. The patient continues with her tuberculosis irrespective of her pregnancy which usually does not influence the disease one way or another. Patients in the first stage of tuberculosis are made no worse by the pregnancy and never die on account of the latter. Great uncertainty prevails with

patients in the second stage of tuberculosis as to the value of therapeutic abortion and literature shows great discord regarding the termination of pregnancy; artificial abortion in cases in the third stage of tuberculosis is of no avail since these patients will die whether pregnancy continues or not.

Tumors of the abdomen, pelvic or otherwise, justify abortion only when malignant. A contracted pelvis should never be accepted as an indication. Surgical method of delivery should be employed here as well as in cases where there is a threatened rupture of the uterus, and also in cases of placenta previa.

There are no foundations for any eugenic indications, and the author agrees with Stratz that the only eugenic indication for terminating pregnancy is hydrocephalus.

RALPH A. REIS.

Van Dongen: Threatened Abortion. *Nederlandsch Tijdschrift voor Geneeskunde*, 1923, ii, 1927.

Bleeding from the uterine cavity during pregnancy does not necessarily mean threatened abortion but is a danger signal not to be disregarded. With the greatest caution, an examination should be made to determine: the presence or absence of pregnancy, intra- or extrauterine, the patency of the cervix, and the presence or absence of protruding parts of the ovum. Here the author cautions not to be too hasty in considering an abortion inevitable simply because the cervix admits the finger. He also calls attention to the necessity of excluding other sources of bleeding; e.g., cervical polyp, cancer, or erosion. Tumors, varices, and traumatism of vagina and vulva may also cause bleeding during pregnancy.

While the severity and duration of the bleeding influence the prognosis, yet van Dongen feels that one should not give up hope too readily, since pregnancy may continue after severe and very prolonged bleeding. To quiet uterine contractions, he gives 20 mg. of opium, four times a day. He has never seen any benefit from viburnum and similar drugs and has discontinued their use long ago. Vaginal tampons are contraindicated as they may excite uterine contractions. It is better to resort to enemata than cathartics to evacuate the bowels.

R. E. WOBUS.

Ogasawara, Kiyoshi: Experimental Studies of Intrauterine Death of Fetus. *Kinki Fujinkwa Gakkwai Zasshi*, 1925, viii, No. 1, 15.

The careful histologic studies both of the fetus and of the placenta after administration of x-rays, and after the injection into the mother animal of various bacterial toxins and different chemicals, showed that only marked alterations in the chorionic tissue, necrosis, and hemorrhages are associated with fetal death. No ill effect of any of these procedures on the fetus itself could be ascertained in the absence of such placental lesions. Thus, the author seems justified in concluding that a primary death of the fetus in utero apparently is impossible.

AUTHOR'S ABSTRACT.

Karlin, M.: The Retention of Dead Fetuses in the Uterine Cavity. *Monatsschrift für Geburtshilfe und Gynäkologie*, 1924, lxxvii, 270.

The author cites three cases of missed labor, the etiology of which was atresia of the cervix, rigidity of the cervix, and carcinoma of the cervix respectively. Eight cases of missed abortion are also described. In the latter cases, after the death of the fetus, the blood vessels in the villi collapsed and the fetal membranes were nourished by the blood in the intervillous space and the blood in the decidual vessels. In four of the cases there was a marked fibrous transformation of the stroma of the villi which aroused the suspicion of syphilis although the histories were entirely negative. The degree of necrosis of the membranes did not

depend as much upon the duration of their retention after fetal death as it did upon the cause of fetal death.

For cases of missed abortion most authors advise active therapy. In infected cases great care must be exercised to avoid trauma. For missed labor, if the membranes are intact and there are no local or general symptoms, a policy of expectancy should be followed unless there is a hindrance to spontaneous dilatation of the cervix. If after two weeks of waiting and the use of drugs, labor does not set in, pregnancy should be terminated artificially. When the membranes are ruptured and the temperature is normal, vaginal cesarean section or a metreurynter may be employed. In infected cases some authors advise hysterectomy after delivery.

J. P. GREENHILL.

Umbach, J.: Intrauterine Fetal Degeneration. *Monatsschrift für Geburtshilfe und Gynäkologie*, 1925, lxxviii, 283.

The author studied seven embryos for evidence of degeneration, and found that the processes involved in the intrauterine degeneration of these fetuses are the same as those observed in autolysis outside the body. The degenerative changes found are not due to "wandering cells" as many authors believe. Some claim these wandering cells are maternal, while others maintain they are fetal in origin. Umbach claims that these wandering cells are simply dead cells produced by autolysis of embryonic organ cells and that they have no function at all. The differences in the histologic picture between anemic infarcts and degenerative embryos are essentially due to the fact that dead embryos are entirely removed from contact with maternal blood.

J. P. GREENHILL.

Kehrer: Proposal for a Standard of Operative Technic in Abortions and Premature Labors. *Zentralblatt für Gynäkologie*, 1923, xlvii, 1163.

Following a discussion at the gynecologic meeting in Dresden, Kehrer has collected a number of points upon which agreement was practically universal, and proposes their adoption as a standard in the termination of pregnancy in the early months.

The two grave dangers are hemorrhage and infection, and the major necessity is the complete removal of the products of conception. As influencing these conditions he advocates antiseptic as well as aseptic care prior to operation, and in the earlier months digital exploration of the uterus. To allow the passage of the finger a tight cervical pack followed by emmenagogues may be sufficient, but in any case the operation is best performed in two stages, the pack being used, if necessary, after moderate dilatation. The great danger is perforation of the uterus. It may be a result of inexperience rather than the use of any particular instrument, but stress is laid on the importance of recognition of the condition, and the immediate necessity for operative care. The difficulty of sterilization renders the use of tents doubtful, and dilatation with Hegar's dilators is often imperfect. It may, however, be complemented either by a pack, the introduction of several tents at the same time, or a small dilating bag.

As the pregnancy progresses the importance of the fetal head as a factor in termination increases, and the separation of the head from the trunk is one of the gravest dangers in association with operations after the tenth week. After emptying the uterus, intrauterine douche is generally unnecessary but may stimulate contraction, lessen bleeding, and lessen the bacterial content of the cavity. Heat and a large quantity of fluid are the essentials, and toxic substances should not be used.

Packing is unnecessary as it favors infection, but in certain instances, as after the removal of a mole or where there is doubt as to the complete emptying of the cavity, a pack may be used for twelve hours.

The later in pregnancy the necessity for interruption arises, the more important is the rubber balloon. Perforation of the aftercoming head may lessen the necessity for complete dilatation of the cervix, and the manual removal of the placenta is discouraged except in cases of extreme necessity.

LITTLE.

V. Franqué, O.: Basic Principles in the Technic of Cleaning Out Abortions.
Monatsschrift für Geburtshilfe und Gynäkologie, 1925, lxi, 320.

The author reports two cases where rupture of the uterus occurred while attempts were being made in the first half of pregnancy to clean out the uterus before the cervix was sufficiently dilated. One of these patients died. On the basis of these cases and much experience v. Franqué lays down the following rules: (1) Before every attempt to empty a uterus after an abortion, the cervix must be dilated sufficiently to admit a finger. In all cases it is advisable to give a narcotic and examine the uterus digitally. (2) A purely instrumental emptying of the uterus is permissible only until the ninth week and only with a large dull curette. (3) Later, a purely instrumental operation is in error. The uterus must be explored with the finger, the secundines separated from the uterine wall and removed with the finger. The curette should be used only to remove portions which have been separated and the small pieces which remain after digital manipulation. (4) Ovum forceps should be used only to remove loosened pieces of tissue which are visible and palpable just inside the internal os. Deeper in the uterine cavity forceps should be inserted only alongside the index finger which constantly controls what the forceps are to grasp and remove. If the cervical canal is too tight for this, oxytocics should be given until there is sufficient dilatation. (5) After the third month it is best to leave the expulsion of an ovum to uterine pains or at least until the cervix is sufficiently dilated to enable easy removal. Until this occurs the uterus should be packed with iodoform gauze. In later months a small bag may be used or a Braxton-Hicks version performed.

J. P. GREENHILL.

Wulff, H.: False Perforation of the Uterus—Relaxation of the Uterus. *Acta Gynecologica Scandinavica*, 1923, ii, 449.

Perforation of the uterus may sometimes be pardonable but never the failure to recognize a perforation. However, there are times when it is difficult to be sure that a perforation has occurred. Wulff reports the case of a patient whom he curetted for an incomplete abortion. At first the curette indicated the length of the uterine cavity to be 14 or 15 cm., but suddenly without encountering any resistance the curette went to a depth of 23 cm. The uterus was extremely soft and could not be definitely outlined bimanually. A perforation of the uterus was suspected and a vaginal hysterotomy performed, but no perforation could be found. The uterus contracted well after removal of the secundines. This was a case of uterine relaxation and not one of perforation.

In the literature five cases have been reported where perforation was suspected but operation failed to show any injury. The author warns against the use of the uterine sound in cases like the one reported. Likewise a sharp curette should not be employed. In cases where the uterus is very soft an effort should be made to produce contractions before curetting. If the uterus cannot be made to contract, digital removal of tissue is the means to be employed. If the cervix cannot be dilated sufficiently to permit the passage of a finger, vaginal hysterotomy followed by digital manipulations is the method of choice. If a perforation is feared one should treat the patient as if the uterus actually was perforated. If the uterine contents are presumably sterile and there is no bleeding and no suspicion of injury to the abdominal organs, one should be conservative.

J. P. GREENHILL.

Heyn: Perforations of the Uterus and Their Treatment. *Zeitschrift für Geburtshilfe und Gynäkologie*, 1924, lxxxvii, 92.

The author draws conclusions from a series of 35 cases. There has been a marked increase in the number of this accident since the war, not only due to the increase in the number of abortions in general, but also as a result of inadequate practical training for young physicians. Four perforations were in nonpregnant uteri, in two associated with a fresh salpingitis. One of these died, the other recovered after total extirpation of the uterus. The other two recovered after simple suture. Of the 12 operated cases of perforation of the pregnant uterus, nine were done by physicians,—only two in criminal abortions. The author believes from the nature and location of the wounds that a great many more than are reported are caused by the Hegar dilators, but that the perforation is not recognized until some other instrument, such as the curette or ovum forceps, is introduced.

Conservative suture of the perforation, even of the pregnant uterus, may in many cases be undertaken without increasing the risk to the patient and thus preserving the genital organs, since in the presence of infection, the opening up of large raw areas for extirpation is in itself a dangerous procedure. The question of liability to uterine rupture in a future pregnancy could only be answered after observation of large series of cases. The question of drainage through the culdesac or extraperitoneally must be decided in the individual case. Very important, especially where injury has been done by grasping instruments, is the systematic search for injury to the bowel. Also important is a search for free pieces of fetus or placenta in the peritoneal cavity, which may easily lead to a fatal peritonitis. All cases of perforation, or even only suspected perforation, should immediately be referred to a gynecologist, since a delay even of hours may be fatal. Prophylaxis is most important. Particular care should be taken in teaching students how to handle such cases and the dangers involved in the use of various instruments.

MARGARET SCHULZE.

Gotting, Fritz: A Contribution to the Management of Abortions. *Klinische Wochenschrift*, 1922, I, 2480.

The policy of immediate cleaning out of the uterus in treating afebrile incomplete abortions is thoroughly established. The same is true as regards abstention from local interference in cases of complicated febrile abortions, especially when periuterine inflammation is present.

As regards the handling of uncomplicated febrile abortions, there exists great diversity of opinion. Many authorities consider that the determination of the infecting organism by bacteriologic study is of the greatest importance. It is agreed that the streptococcus is the most dangerous, and a conservative policy is advised by most authorities when it is found, especially if it is of the hemolytic variety, since the mortality in patients infected with this organism is 10 to 15 per cent. In Frank's clinic such bacteriologic studies have not yielded definite results of prognostic value, except that in cases of hemolytic streptococcus infection the prognosis appears to be worse. But it is not hopeless even when these organisms are found in the blood.

The author is in favor of more active measures for the following reasons: (1) Cleaning out the uterus is often necessary on account of free bleeding; (2) the infected, adherent placenta may be the source of a continuous bacterial invasion of the maternal blood stream; (3) time is saved both for the hospital and for the patient.

The results have been thoroughly satisfactory. Of the 1268 cases of abortion reviewed in this paper 650 (51.3 per cent) were febrile. This percentage has steadily increased since the war years (in 1913 it was 42 per cent), doubtless due to an increase in the number of criminal abortions as a consequence of the eco-

nomie depression. Of these cases, in 44 the uterus was emptied by the physician before admission, in 137 cases, which were conservatively handled on account of some complication, the uterus emptied itself spontaneously, and in 1987 patients the uterus was cleaned out in the hospital. There were 66 deaths (5.2 per cent), and complications after the cleaning out were recorded in 66 patients (5.2 per cent). Of the 66 deaths, only 25 had had local treatment in the hospital (a mortality of 2.3 per cent to the credit of active therapy); 23 of the 41 others had periuterine inflammation, 8 had had the uterus cleaned out before admission, 5 were very septic (some of these were moribund on admission), 3 had severe peritonitis, 1 had a lung abscess, and 1 had pulmonary tuberculosis. The febrile abortions showed a gross mortality of 10.1 per cent; the cases of this group in which the uterus was cleaned out in the hospital had a mortality rate of 3.8 per cent.

The evacuation of the uterus is gently done under narcosis, after dilatation of the cervix sufficiently to admit the finger. If this cannot be done, a laminaria tent is employed, but not for more than twelve hours, because of the danger from retention. When the cervix is open, the ovular remnants are loosened with the finger, removed with Winter's placental forceps, then a large blunt curette is used if necessary to remove fragments not detached by the finger, and finally a hot intra-uterine douche of salt solution is given. If the uterus is flabby, an ergot preparation is given hypodermically. Packing is performed only when necessitated by free bleeding. In one case the uterus was perforated by the curette; supravaginal hysterectomy was at once performed, with recovery.

In impending abortion with complications, conservative and supportive measures are employed.

The author remarks incidentally that lues played a minor part in the etiology of these abortions; of 475 Wassermann tests on these patients, it was positive in only 20, or 4.2 per cent.

E. L. KING.

Tuttle, Howard K.: The Treatment of Abortions. Surgery, Gynecology and Obstetrics, 1925, xl, 87.

The writer reviews 1,164 cases of abortion at the Ancon Hospital, Canal Zone, to compare his results with those of other clinics. His references are, however, limited to two writers of Chicago and one personal communication.

He is of the opinion that hemorrhage sufficiently severe to call for immediate active treatment is seen in approximately 5 per cent of all cases. Febrile cases operated upon promptly have a slightly higher average number of postoperative febrile days, a lower per cent of morbidity, and fewer average hospital days than those operated upon a number of days after the temperature has remained normal. The average febrile days, morbidity percentage, and average hospital days of operative cases are lower than in the nonoperative. Those cases where infection has extended beyond the uterus, and without evidence of retained necrotic placenta or membranes, should be treated expectantly. When tissue remains in the uterus it is just as essential to remove it as a sloughing appendix in the abdomen.

WM. C. HENSKE.

Gordon: The Management of Abortion. Journal American Medical Association, 1924, lxxxii, 1021.

A series of 961 consecutive cases of abortion was divided into septic and aseptic. Septic cases are those with temperatures of 101° F. by rectum. In a further classification of a total of 1,640 abortions into threatened, inevitable, and incomplete, there were 1528 incomplete abortions. The management of the threatened case consists in preparation as though for labor. No intravaginal cleansing, bedrest, morphine, $\frac{1}{6}$ grain hypodermically—repeated two or three times, and daily enemas. If the case passes to the inevitable stage, and bleeding is excessive, by

means of vaginal packing or stick-sponge the removal of the products of gestation from the dilated cervix is attempted. Sixty-two per cent were packed; 10 per cent required repacking. Pituitary extract, 0.5 c.c. is given every three or four hours. If the case passes to the incomplete type, expectant treatment is carried out unless profuse hemorrhage warrants curettage. Three per cent were curetted. All the septic cases were treated without intrauterine manipulation. These cases were kept outdoors, in Fowler's position. Forced feeding, blood transfusion, vaccines, serums, foreign protein, etc., were relied upon.

W. KERWIN.

Dietrich: Collective Statistics on the Treatment of Febrile Abortion. *Archiv fuer Gynaekologie*, 1923, exx, 14.

The author collects ten thousand cases reported from twenty clinics. The mortality was 4.8 per cent after active treatment which included some conservative methods and 3.1 per cent after entirely expectant treatment. The mortality after curettage was 3.4 per cent; if palpation was used it rose to 4.4 per cent, and after digital emptying of the uterus it was 5.9 per cent.

RALPH A. REIS.

Pelkonen: On the Treatment of Febrile Abortions. *Finska läkaresällskapets handlingar*, 1924, lxvi, 570.

The number of febrile abortions managed in the Wiborg District Hospital is varying but persistently increasing since 1919. The author thinks that poor housing and financial distress force an ever increasing number of women to seek hospital care, but that also criminal abortions have become decidedly more numerous. From 1898 to 1923 a total of 1766 abortion cases had been treated; of them 1,174 were admitted between 1914 and 1923, among them 378 being febrile patients. Of this last group, 330 were treated actively, the remaining 48 cases conservatively. Mortality in the actively treated was 2.1 per cent, but zero in those conservatively managed. In determining the indications for appropriate therapy, the hospital followed rather closely the rules laid down by Halban (*Zentralbl. f. Gynaek.*, 1921, p. 439). If careful palpation fails to show any involvement of adjoining structures, the uterus, in case of fever is evacuated. Often it is advisable to wait a few days, for the temperature may become normal in the meantime. In cases in which it seems likely that adjoining structures are involved in the infectious process, the patient is treated conservatively on principle. Interference then is considered justified only by severe hemorrhage in spite of possible harm from the operation.

AUTHOR'S ABSTRACT.

Grabich, F.: Active or Conservative Treatment of Septic Abortion. *Monatsschrift für Geburtshilfe und Gynäkologie*, 1923, lxiv, 308.

In the Dortmund Clinic among 554 cases of febrile abortion there was a mortality of 0.7 per cent for those treated actively, 1.6 per cent for those treated conservatively, and 1.3 per cent for those treated expectantly. Grabich reports 100 additional cases of septic abortion treated actively. In 76 cases the temperature fell markedly within twenty-four hours after emptying the uterus. Bacterial studies which were made in nearly all the cases were of little value. The patient's resistance alone is of importance in overcoming the infection.

Of greater importance than the bacteriology is the question of how to empty the uterus. The means to be considered are the ovum forceps, the curettage and the finger. The method of emptying the uterus must be as harmless as possible, and to accomplish this best, the author recommends the broad, dull curette. Digital removal of tissue maltreats the uterus and may force infected material through the tubes into the peritoneal cavity. Antiseptic douches are not to be used. After emptying the uterus the patient should be given stimulative therapy.

J. P. GREENHILL.

Ten Berge: The Treatment of Abortion and Puerperal Sepsis. *Nederlandsch Tijdschrift voor Geneeskunde*, 1925, ii, 798.

In the light of current opinion on the treatment of abortion, Ten Berge reviews his own experience, citing illustrative cases. He sums up the subject as follows: by the timely removal of *all* ovular remnants, the occurrence or extension of infection may often be avoided. In order to avoid causing wounds through which the infection may spread, the removal should be carefully done manually. Whenever the infection is still limited to the uterine wall, the patient usually recovers quickly after the emptying of the uterus. In case of periuterine infection, the genitalia should be manipulated as little as possible. Should bleeding compel intervention in such cases, the uterus should be emptied with the greatest of gentleness. All patients in whom the infection has extended beyond the uterus, should be removed to a hospital in order to receive the utmost care.

Ten Berge has used electrargol, as well as the polyvalent serum and quinine injections proposed by Gordon Luker, but has not been able to see any favorable results ascribable to their use.

R. E. WOBUS.

Henrard, E.: Quinine Therapy in Febrile Abortions. *Monatsschrift für Geburtshilfe und Gynaekologie*, 1923, lxiii, 19.

In all stages of febrile abortions, quinine therapy is indicated. Two c.c. of a 25 per cent solution of quinine hydrochloride should be given both intravenously and intramuscularly and in addition two one-quarter grain tablets of quinine hydrochloride should be given by mouth. In 88 per cent of the author's cases of febrile abortions in progress, and in 52 per cent of his febrile cases where the placenta was retained, the uterus was emptied by means of this treatment. In the cases where small pieces of placental tissue remained in the uterus the quinine proved unsuccessful in emptying it. However, in the latter cases the quinine produced a softening and dilatation of the cervix, making instrumental dilatation unnecessary. Manual removal of the placenta was very easily accomplished in the latter patients. The author emphasizes that one must carefully watch the patients for profuse hemorrhage after the use of quinine.

J. P. GREENHILL.

Hellendall: Supravaginal Amputation of the Uterus in Severe Postabortive Bleeding, for the Purpose of Hemostasis and Sterilization. *Zentralblatt für Gynäkologie*, 1924, xlviii, 324.

The incidence of severe hemorrhage as the result of abortion, particularly in those cases where some constitutional disorder is present, has suggested the importance of the suprapubic hysterotomy and sterilization, which has been undertaken frequently by many operators. Hellendall would go a step further and in these cases remove the body of the uterus, believing that the blood loss is considerably less, that the convalescence is more rapid, and that the tendency to postoperative complication is also decreased.

LITTLE.

Heim: Two Cases of Physometra. *Zeitschrift für Geburtshilfe und Gynäkologie*, 1924, lxxxvii, 156.

The author describes, in considerable detail, two cases of gas bacillus infection of the uterus following early abortion.

MARGARET SCHULZE.

Special Article

ON THESES BY UNDERGRADUATE STUDENTS OF MEDICINE

THE curriculum of American medical schools has been subjected to extended revision in the last two decades and the necessity for including many laboratory and theoretical subjects has reduced the time devoted to the clinical and bedside teaching. Among other things the "thesis" formerly much in vogue as a requirement for graduation, has been largely abandoned, although it cannot be denied that it had an undoubted value in stimulating an independence of thought and brought the student into more intimate contact with the problems of medicine, while it provided a relief from the possible tedium of textbook study, laboratory exercises and didactic lectures.

The Editor of the Journal takes pleasure in presenting to his readers extracts from a series of theses contributed by students of the Cornell University Medical School during their fourth year of attendance, as a part of their work in the department of gynecology carried out in the wards and record rooms of the Woman's Hospital under the guidance and supervision of Dr. Geo. Gray Ward, Chief Surgeon of the latter and Professor of Gynecology and Obstetrics at Cornell Medical School. Both the titles and the subject matter are of interest. Lack of space forbids the complete publication of these valuable contributions, of which selections follow, but they may be found complete in the *Surgical Report of the Woman's Hospital*, for 1925.

—G. W. K.

POSTOPERATIVE LEUCOCYTOSIS

A STUDY OF THIRTY CASES FROM THE WARDS OF THE WOMAN'S HOSPITAL OF NEW YORK¹

BY MARGARET S. WITTER, A.B., M.D., NEW YORK, AND
WILLIAM P. ELLIOTT, A.B., M.D.

(Fourth Year Students, Cornell University Medical College)

THERE often arise, during the course of a case, occasions when the leucocyte count is desired as an aid in the diagnosis and prognosis of postoperative events. In order critically to interpret such a postoperative count, it is necessary to have some judgment as to the average normal count after operation, and as to the limits which may be considered normal and beyond which one should be suspicious of untoward events.

¹The First Polk Prize in Gynecology was awarded to Dr. Witter for this thesis.

If we are to accord the leucocyte count high rank, we must perfect our judgment of the normal leucocyte values. Therefore, it seemed to us that a study of a number of average, "clean" cases with uneventful recoveries would afford some basis for such a judgment of the normal postoperative leucocyte curve. It is the purpose of this article to present a study of 39 such cases from the wards of the Woman's Hospital in the State of New York, done under what we consider to be practically standard conditions. That is:

1. The cases were entirely from the service of Dr. George Gray Ward. They had no complicating events throughout their entire postoperative course, and were of the type considered as average, "clean" cases.
2. The preoperative preparation, the anesthesia, the operative procedures, the immediate and later postoperative care, all conformed to standard technic.
3. The counts used as data in Series I were done by an experienced technician, doing all routine counts in the hospital and using consistent technic.

SERIES I

Thirty cases were studied. A preoperative count was taken some time during a 1 to 3 day preoperative interval. We assumed that, under non-varying conditions, an uninfected case should have a fairly constant count preoperatively; and we found this to be true in several cases in which daily preoperative counts were done for a week. Therefore, these counts have been charted as "pre-op," irrespective of the exact day.

Beginning with the first postoperative day, counts were then done daily for 5 to 8 days.

OBSERVATIONS

Table I shows the minimum, maximum, and average total leucocyte counts for each day, with number of cases counted.

TABLE I
TOTAL LEUCOCYTE COUNTS

DAY OF COUNT	NUMBER OF CASES	MINIMUM	MAXIMUM	AVERAGE
Pre-op.	30	6000	13000	9000
1	21	12000	26000	18000
2	24	10000	27000	16000
3	28	9000	21000	13000
4	25	6000	21000	11000
5	23	7000	19000	10000
6	23	8000	19000	12000
7	18	7000	24000	13000

Table II shows the minimum, maximum, and average percentage of polynuclears for each day, with the number of cases.

TABLE II
PERCENTAGE OF POLYNUCLEARS

DAY OF COUNT	NUMBER OF CASES	MINIMUM	MAXIMUM	AVERAGE
Pre-op.	30	42	80	66
1	20	73	94	82
2	26	75	93	82
3	28	73	93	79
4	24	64	87	76
5	24	58	74	70
6	17	70	84	75
7	21	62	83	75

Table III shows the minimum, maximum, and average temperatures for each day, with the number of cases.

TABLE III
TEMPERATURES (DEGREES FAHRENHEIT)

DAY OF COUNT	NUMBER OF CASES	MINIMUM	MAXIMUM	AVERAGE
Pre-op.	30	98.0	99.8	98.6
1	22	98.8	104.0	100.8
2	25	98.0	102.8	100.4
3	28	98.4	100.8	99.6
4	25	98.4	100.8	99.6
5	26	98.6	100.8	99.4
6	22	98.6	100.6	99.0
7	23	98.4	100.6	99.0

DISCUSSION

From Figure 1,* we can see that there is a leucocyte curve which is highest on the first day after operation, at 18,000. It then steadily declines to normal on the fifth day (10,000), and then rises slightly on the sixth and seventh days.

The cause of this secondary rise has not been determined, or its duration. It has been suggested that the absorption of suture material at this period may be the etiologic factor.

The leucocytosis would seem to be mainly a polynucleosis. The preoperative differentials show a low percentage of polynuclears,—average 66 per cent—Table II. The operation is followed by a rise and the curve remains at its height for two days and descends a bit more slowly than the total leucocyte curve.

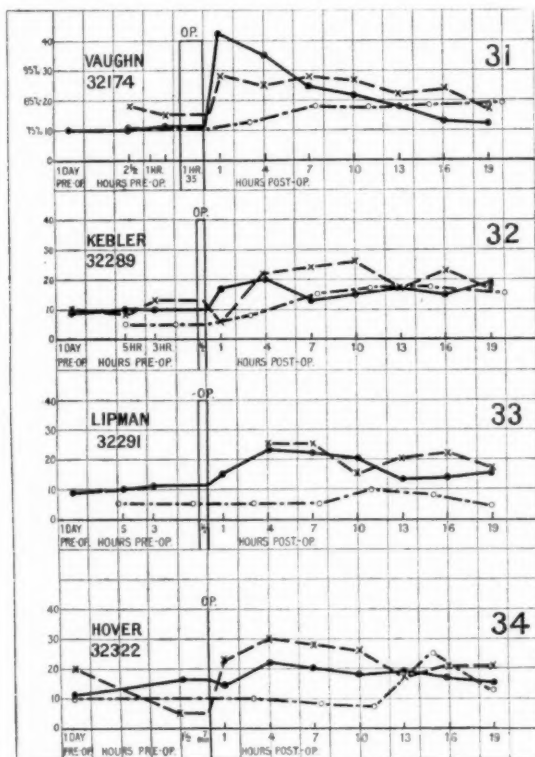
The temperature curve, likewise, Figure 3,* shows its peak on the first day and descends slowly to high normal—99.0—on the sixth day. The figure showing the average temperature curve would lead one to believe that the leucocytes and temperature bear a constant, direct relationship, but the individual charts appended show that the relationship is not so close.

*See original article, *Surgical Report of the Woman's Hospital*, 1925.

Having seen from Series I that there was a fairly constant postoperative leucocyte curve during the first week, we were interested to know when the peak of the leucocytosis occurred. From Figure 1,* one would infer that the peak was one day after operation. In order to investigate this, nine cases were studied in detail.

SERIES II

Blood counts were done on the day preceding operation, and at 11:30 A.M., and 1:30 P.M., of the day of operation. The operation occurred from 2:30 to 4:30 P.M. A count was then done one hour after operation and every three hours thereafter during the night. During this period,



Charts 31-34. Series of hourly postoperative blood counts. Total leucocyte count — — — —; per cent polynuclears — — — —; temperature degrees Fahrenheit

Fig. 31. The operation performed consisted in a panhysterectomy, salpingo-oophorectomy bilateral, separation of adhesions, appendectomy. The time consumed was 1 hour, 35 minutes.

Fig. 32. The operation consisted in a Kelly stitch (for incontinence) and perineorrhaphy. The time consumed was 35 minutes.

Fig. 33. Operation: Kelly for retroversion. Time: 34 minutes.

Fig. 34. Operation: dilatation and curettage. Time: 7 minutes.

*See original article, *Surgical Report of the Woman's Hospital*, 1925.

the patients were kept in the recovery room. The same methods were used as in Series I. Temperatures were taken every four hours, routinely, by the nurse.

OBSERVATIONS

Charts 31 to 39 inclusive show the results, charted in hours after operation, while charts 31A, 32A, 33A, show the curves as charted according to scale used in Series I.

The percentage of polynuclears varied in general with the leucocytosis, rising to a peak, in the majority of cases, around the fourth hour, and in all cases the peak was reached by the tenth hour.

There is, however, no close association between total leucocytes and percentage of polynuclears.

The temperature, as may be observed from the charts, does not rise synchronously with the leucocytes. In no case was the peak reached before the seventh hour after operation.

CONCLUSIONS

1. There is a leucocytosis following operation which reaches its height by the fourth hour after operation, and returns to normal by the fifth day.

2. We are led to believe that the height of the peak varies directly with the duration of operation, and extent of associated trauma produced, other factors being negligible.

3. The leucocytosis seems to be mainly a polynucleosis, the average of which compares grossly with the average total leucocyte count.

4. The temperature does not rise synchronously with the leucocytes but reaches its height several hours later. The average curve then remains grossly parallel with the leucocyte curve, but inasmuch as the temperature and leucocyte curves are not parallel in individual cases, one cannot assume that a certain temperature is constantly associated with a certain leucocytosis.

5. A further study of a larger series is necessary to correlate the various factors involved in this leucocytosis.

THE INCIDENCE AND END-RESULTS OF CARCINOMA OF THE OVARY AT THE WOMAN'S HOSPITAL

By CHARLES S. BYRON, A.B., M.D., AND HARRY S. BERKOFF, A.B., M.D.

IN the period between Jan. 1, 1908, and January 8, 1923, 87 cases of carcinoma of the ovary were recorded at the Woman's Hospital. This study will be limited to 82 of those cases, the remaining 5 lacking either operative or pathologic confirmation of such a condition. During that same period 29,844 cases were admitted to the

Gynecological Service of the hospital, giving an incidence of 0.27 per cent for carcinoma of the ovary (Table I). There were also recorded 535 carcinoma of the cervix and 296 carcinoma of the body of the uterus, incidences of 1.8 per cent and 0.99 per cent respectively, placing carcinoma of the ovary as the least common of the more frequent genital neoplasms. Of the 2517 ovarian cystomata treated during that time, the 82 carcinomata form rather a small proportion—3.15 per cent, while the 53 cystic carcinomata in the series form a proportion of 2.1 per cent. The apparent increase in the number of cases of carcinoma of the ovary in recent years is only in keeping with the greater registration of the hospital and does not indicate a greater frequency of occurrence.

TABLE I
GENERAL INCIDENCE OF CARCINOMA OF THE OVARY
Between Jan. 1, 1907, and Jan. 1, 1923

	NO. OF CASES	PER CENT
Total number of admissions	29844	
Carcinoma of ovary	82	0.27
Carcinoma of cervix	535	1.8
Carcinoma of body of uterus	296	0.99
Relation of Carcinoma of the Ovary to Ovarian Cystomata		
Number of ovarian cystomata	2517	
Carcinoma of the ovary	82	3.15
Cystic carcinoma of the ovary	53	2.1

TABLE II
AGE INCIDENCE OF CARCINOMA OF THE OVARY
Total Number of Cases 81

AGE	CASES	PER CENT
10-19	1	1.23
20-29	7	8.61
30-39	17	20.96
40-49	20	24.6
50-59	28	34.57
60-69	8	9.84

Youngest 19 years; Oldest 68; Average 45.9.

TABLE III
INCIDENCE OF FAMILY HISTORY OF MALIGNANCY
Total Number of Cases 54

	CASES	PER CENT
Positive	9	16.66
Negative	44	81.5
Possible	1	1.85

A perusal of Table II will reveal a distribution of occurrence of carcinoma of the ovary over six decades, 59 per cent of the total cases falling in the fifth and sixth decades. The greatest incidence lies in the fifteen year period between the ages of forty-five and

sixty—53 per cent. A large proportion, approximately 31 per cent, however, occurred below the age of forty, outside the so-called cancer age.

Out of 54 patients in whose records a definite family history was present, nine were positive for malignancy, a proportion of 16.6 per cent. The percentage stated above is high enough to be of significance, and bears out further the hereditary aspect of carcinoma.

TABLE IV
SOCIAL STATUS OF PATIENTS WITH CARCINOMA OF OVARY
Total Number of Cases 82

	CASES	PER CENT
Ward patients	41	50
Private patients	41	50

Fifty per cent of the patients in this series (Table IV) were private patients, which perhaps indicates a greater occurrence among the better classes. Not too much import, however, should be attached to this condition.

TABLE V
A. MARITAL STATUS OF PATIENTS WITH CARCINOMA OF OVARY
Total Number of Cases 81

	CASES	PER CENT
Single	19	23.4
Married	53	65.4
Widowed	9	11.1

B. OBSTETRICAL HISTORY IN MARRIED WOMEN WITH CARCINOMA OF THE OVARY
Total Number of Cases 44

	CASES	PER CENT
With full-term children	29	66
Never pregnant	10	22.7
Miscarriages only	5	11.3

C. INCIDENCE OF WOMEN WHO WERE NEVER PREGNANT
Total Number of Cases 54

	CASES	PER CENT
Married	10	18.5
Single	10	18.5
Total	20	37

Twenty-three per cent of the patients in this series (Table V) were single, a significant proportion. One of the married women, aged, twenty-seven, had been married only one month when she came under observation. She had, however, had symptoms and signs of a pelvic condition several months previous to marriage and might perhaps be included in the single group. Of the 44 married women in Part B of this table, 10, or 22.7 per cent had never been pregnant

and 5, or 11.3 per cent had been pregnant but had never given birth to a full-term child. In Part C of Table V, 20 women (single and married) in a series of 54 cases, a proportion of 37 per cent, had never been pregnant. These statistics may be taken to suggest some ovarian dysfunction, some anatomic anomaly which later became carcinomatous, and which prevented proper functioning. This may be true especially in the light of the fact that in only one case was there found, on examination, aside from the ovarian condition, a cause for sterility. That one was a case of antelexion. On the other hand, the above statistics may indicate a greater susceptibility to carcinoma of the ovary, in women who have never been pregnant.

TABLE VI

INCIDENCE OF MENOPAUSE IN WOMEN WITH CARCINOMA OF THE OVARY
Total Number of Cases 54

	CASES	PER CENT
Menopause present	26	48.2
Menopause absent	28	51.8

Most Common Period For Occurrence of Menopause from 45 to 51 years—65.3 per cent.

Earliest—40 years; latest—56 years; average—48.8 years.

Menopause not yet Reached—Youngest age—19 years; oldest age—55 years; average age 36.3 years.

Forty-eight per cent of the patients in a series of 54 were past the menopause (Table VI). The average age at which the climacteric occurred was 48.8 years, the youngest at forty, and the oldest at fifty-six. There is not much significance in these figures, the menopause being evidently neither delayed nor occurring prematurely. The period of greatest incidence was that between forty-five and fifty-one years, quite within normal limits. Any relation that the menopause may bear to carcinoma of the ovary, is only the relation which the period, in which it commonly falls, bears to carcinoma in general.

Ten patients, as shown in Table VII had had previous operations.

TABLE VII

INCIDENCE OF PREVIOUS OPERATION IN WOMEN WITH CARCINOMA OF THE OVARY

PREVIOUS OPERATION
Operation for intestinal ulcer.
Dilatation and curettage.
Dilatation and curettage and trachelorrhaphy.
Dilatation and curettage and insertion of stem pessary.
Removal of ovarian teratoma.
Removal of fibroid of uterus and appendectomy.
Operation for laceration of pelvic floor.
Repair of cervix and perineum.
Operation for hernia (2 cases).
Trachelorrhaphy.

TABLE VIII
DURATION OF SYMPTOMS

TOTAL NUMBER OF CASES 56	
Shortest	1 month
Longest	48 months
Average	10 months

The average duration of symptoms in 56 cases, as noted in Table VIII, was ten months. The longest forty-eight months, and the shortest one month. One of these patients had had an abdominal mass for ten years, but her active symptoms had been present for only three months. At operation a cystic carcinomatous mass was found in one ovary, while the other ovary had a benign cystoma attached to it. This latter was probably the tumor previously present. A duration of ten years has therefore not been ascribed to this case.

* * * *

By far the most frequent group of carcinoma reported was the papillary serocystic type, carcinoma ovarii serosum. This type was present in 52 per cent of the cases. Four of these exhibited calcific deposits. Next in frequency was the glandular and solid carcinoma, the adenocarcinoma of some, and almost as frequently the pseudomucinous cystic type was found. But five cases of the primary medullary carcinoma were reported. In every type the bilateral form occurred much more frequently than the unilateral form; in the primary medullary type not one unilateral growth appeared.

Only four specimens were definitely reported as being secondary, a percentage of 5.3. In none of the other cases was there any definite evidence found of a primary focus, either at operation or after gross and histologic examination of the growth. Of the four, two had metastasized from adenocarcinoma of the body of the uterus. The remaining two were of the Krukenberg type, in one of which a definite infiltration of the cardiac end of the stomach was found. The other was the case previously mentioned, in which an operation for ulcer of the intestine was performed.

Metastases at operation (Table XII)* were found in 50 per cent of the cases in the series of 78. The most frequent distribution was to peritoneum, next the omentum, the uterus, broad ligaments and tubes. Less commonly, the other abdominal viscera were involved. The liver was involved in 5 cases and the lymph nodes in only 3. A general carcinomatosis and skin involvement was present in but 1 case. The entire abdomen was infiltrated in 2 cases out of the 39.

The average duration of symptoms in 21 cases which showed metastases at operation in a series of 35 was 11.2 months, while for the remaining 14 cases without metastases, the average was only 4.9

*This and other tables omitted here for lack of space.

months, indicating that the longer the duration of symptoms the more probable is the presence of metastases and that most cases of carcinoma of the ovary of 11 months' or more duration would probably have metastases somewhere.

According to age incidence, metastases were most frequent in the seventh decade and least frequent in the fifth. The greatest number of cases with metastases occurred in the sixth decade, 17, or 60 per cent. The smallest percentage of metastases occurred in the fifth decade.

The pathology which most frequently gave metastases was the pseudomucinous type, 61.5 per cent of which were found to have infiltrated other organs. The least frequent to metastasize was the serous type.

As stated at the beginning of this article, a poor follow-up system in the earlier days has greatly reduced the number of cases available for study. I was able to completely trace but 53 patients in any series. Of these, 16 had died from the effects of operation, from causes listed in Table XIII, A. Since this number represents the number of deaths in 79 operations, an operative mortality of 20.3 per cent is derived, a high mortality for any operation. This is a fair indication of the generally weakened state of patients with carcinoma of the ovary. Of the remaining 37 cases, 25 are dead while 12 are still alive. Among the living, the average length of life is 46.2 months, the longest having lived nine years, the shortest six months. Among the dead, the average length of life was 14.9 months, the longest three years, the shortest one month.

END-RESULTS

Most of the deaths occurred in the first year after operation. Of the 25 patients who died, 16 or 64 per cent died in the first year. In all, of the 53 patients operated upon, 32 or 60.3 per cent were dead at the end of one year, and 36 or 68 per cent at the end of two years. Only one of these patients reached the third year.

The duration of symptoms appears to have had little effect upon the end-results. In both the living and dead the average duration was approximately the same.

Despite the fact that the radical operations, the supravaginal hysterectomy and the panhysterectomy with bilateral salpingo-oophorectomy have the greatest operative mortality, the proportional number of patients living after each is higher than after any of the more conservative procedures. It is surprising to note also that the operative mortality is relatively greater following the supravaginal hysterectomy than it is following the panhysterectomy. The average duration of life in the living cases is longest after the supravaginal hysterectomy with bilateral salpingo-oophorectomy. The longest individual duration of nine years, however, followed a unilateral salpingo-

oophorectomy. Among the patients who have died, the longest average length of life followed bilateral salpingo-oophorectomy, with the average length of life following panhysterectomy with bilateral salpingo-oophorectomy next in duration. The longest individual duration occurred in the one patient who died following supravaginal hysterectomy with bilateral salpingo-oophorectomy. The greatest mortality followed exploratory laparotomy, 100 per cent of the 10 patients having died, 5 from the effects of the operation, and 5 within an average of 7.5 months, the longest case having lived 26 months. These patients, however, were late cases, in which the disease was far advanced, inoperable when the abdomen was opened and, therefore, in poor condition at the time of operation.

Among the primary carcinomata, the greatest average length of life in the living patients occurred in those with carcinoma ovarii serosum

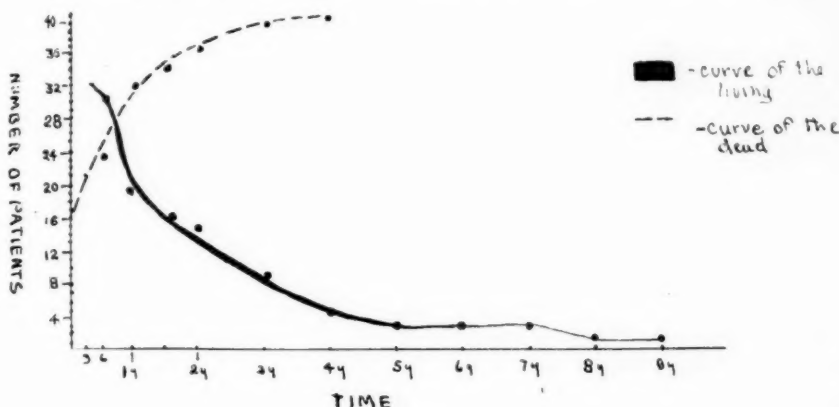


Fig. 1.

bilaterale. The average length of life in 3 cases with the unilateral type was next in order. The longest individual length of life occurred in a patient with carcinoma ovarii serosum unilaterale. She is alive nine years after operation. Among the dead, the greatest average length of life occurred in 4 patients in the series of 8 with carcinoma ovarii serosum unilaterale. The greatest individual length of life occurred in 2 patients, one with carcinoma ovarii serosum bilaterale, the other with carcinoma ovarii glandulare et solidum. The shortest average length of life in the dead occurred in the series of 2 patients with carcinoma ovarii glandulare et solidum unilaterale. The shortest individual length of life occurred in 2 patients, one with carcinoma ovarii pseudomucinosum unilaterale, and one with carcinoma ovarii glandulare et solidum unilaterale. The greatest operative mortality occurred in patients with carcinoma ovarii glandulare et solidum bilaterale, 66 per cent of the patients having died from the effects of operation.

Of the two secondary carcinomata listed, the patient with the metastatic growth from the uterus is still alive after 55 months, the primary tumor having been removed at operation. The patient with the Krukenberg tumor, metastatic from the stomach, died within 5 months.

It is unfortunate that, aside from the data for the serous group, a larger series of cases could not have been obtained so that perhaps more accurate statistics might be compiled.

The living patients without metastasis at operation in a series of 35 cases have lived, on an average, 18 months longer than those with metastasis. Among those who have died, the patients without metastasis survived those with metastasis by 6 months. Therefore, it would seem that metastasis present at operation materially shortens the post-operative period of life.

THE INCIDENCE OF CARCINOMA IN THE CERVIX FOLLOWING SUPRAVAGINAL HYSTERECTOMY

BY SAMUEL S. HOCHMAN, M.D.

CHARACTER AND EXTENT OF ORIGINAL DATA

THE object of this study is to determine the incidence of carcinoma in the cervical stump after supravaginal hysterectomy for reasons other than malignancy, with special reference to the technic employed regarding the cervix. The follow-up records of the supravaginal hysterectomies performed at the Woman's Hospital during the five years from 1918 to 1922 inclusive, were carefully reviewed for any evidence of malignancy. The histories of all the cases of carcinoma of the cervix admitted during the same period of time were also examined to see whether a supravaginal hysterectomy had been done elsewhere, prior to entrance into the Woman's Hospital. In so far as possible, information was obtained from the other hospitals and surgeons regarding the cases in question. Most of the surgeons who had done the operations here, and with whom it was possible to communicate, were personally asked whether any of their cases had subsequently developed malignancy of the cervical stump, subsequent to the operation, and what their technic regarding the cervix was.

In a series of 1,114 hysterectomies (supravaginal), there was an occurrence of only 3 cases of malignancy of the cervical stump, or 0.27 per cent, up to the present time.

Of the total number of operations, 377 had also a reaming out of the cervical mucous membrane, of which 1 or 0.26 per cent developed carcinoma of the cervical stump subsequently, this technic evidently not preventing future malignancy.

The stump and cervical canal were carbolized in 595 of the operations, and of these, 2 or 0.33 per cent developed future malignancy, proving that this technic also is no safeguard against future malignancy. However, the surgeons who use it do not hope for absolute freedom from malignancy in the future, but freedom from infection with cervicitis and endocervicitis.

During the same period of time, 1918 to 1922, all the cases of carcinoma of the cervix, excluding readmissions, of course, were reviewed for a history of a previous supravaginal hysterectomy. There were 263 new admissions, of which 7 had a positive history of a supravaginal hysterectomy for a nonmalignant condition. I say positive because in several instances, which have been excluded from this series, although the diagnosis was made clinically and pathologically of carcinoma of the cervix, further investigation proved that the operation had been a panhysterectomy or in two cases supravaginal hysterectomy for carcinoma of the uterus.

Of the above 7 cases of malignancy, 3 were operated in this hospital, and are included in the table of supravaginal hysterectomies. The remaining 4 were operated on at other hospitals and although every effort was made to secure information regarding them from their surgeons and places of operation, very little was obtained.

CONCLUSIONS

1. In a series of 1,114 supravaginal hysterectomies at Woman's Hospital, 3 or 0.27 per cent developed subsequent carcinoma of the stump.

2. In a series of 263 cases of carcinoma of the cervix, 7 or 2.66 per cent had had a supravaginal hysterectomy for a nonmalignant condition, at which time, 4 of the 7 cases were most likely coexistent, leaving only 1.14 per cent truly subsequent cases of carcinoma.

3. In 377 of the operations with coning out of the cervix, 1 or 0.26 per cent developed carcinoma of the cervical stump.

4. In 595 of the operations with carbolization of the stump, 2 or 0.33 per cent, developed future malignancy.

5. Coning out of the cervix helps prevent future infection, and in a great measure, future carcinoma of the cervical stump. This technic takes no more time than carbolization, which does not even prevent infection, much less cancer, and should be adopted as a routine in supravaginal hysterectomy.

6. The occurrence of carcinoma in the stump of the cervix does not warrant a panhysterectomy with its much greater mortality. In the above series, 1,111 cervixes would have needlessly been removed with the loss of the keystone of the arch and complications resulting from a disturbance of the pelvic anatomy. Moreover, even panhysterectomy does not give assurance of freedom from future malignancy.

7. Where a definite pathologic cervix which is lacerated or infected—especially where discharge is present, exists at the time of the supravaginal hysterectomy, it should be removed then or as soon as possible.

8. All cases after a supravaginal hysterectomy should have an adequate follow-up system with definite periodic examinations for any changes in the cervix and for any history of bleeding or discharge. This is extremely important for the early detection of carcinoma, with favorable prognosis by early treatment, especially radiation.

9. A very careful examination should be made of the cervix at the time of operation (hysterectomy) to decide whether the cervix should be removed with the uterus, and if not, in all doubtful cases, a sufficient amount should be excised for pathologic examination. This is especially important where any degeneration or necrosis exists in the uterus.

10. There is a definite relationship between myoma and carcinoma of the uterus.

A STUDY OF THE EFFECT OF ETHER ANESTHESIA ON THE ISOAGGLUTININS OF HUMAN BLOOD

BY PHILIP REICHERT, A.B., M.D., AND MORRIS BEAKE, A.B., M.D.

Blood groups are determined in the Woman's Hospital by mixing in a hanging drop the citrate-washed blood cells with high titer known sera, and the agglutination reaction is observed by microscope after a half hour at room temperature. Direct combination of the patient's serum and the donor's corpuscles is done in addition in a similar manner. The procedure has given clinically satisfactory results in a great many cases.

In September, 1922, Levine and Segall⁵ reported three cases of prolonged ether anesthesia (two to two and a half hours) in which the patient's serum collected in the twenty-four hours immediately following the operation coagulated the cells of donors who had been matched before the operation and whose cells they did not then coagulate. This report was disquieting not only from a clinical standpoint, but it needed immediate confirmation or rebuttal from the laboratory, for it seemed to disprove all the universally credited notions of the immutability of the agglutinin groups.

We determined, therefore, to group in the usual way a consecutive series of fifty patients in the Woman's Hospital immediately before and immediately following a major operation. Of these we report thirty-eight cases since we eventually selected as worthy of note only those in which the time of anesthesia was more than an hour.

In each case there are noted the operations performed and the comparative blood pressures as an index of the effect of the procedure on the general system. The preoperative blood samples were taken in the twenty-four hour period immediately preceding the operation; the postoperative sample was taken in no case more than five hours after the procedure—in the vast majority of the cases not more than twenty minutes had elapsed since the operation and the patient was still in profound narcosis as the sample of blood was taken.

While this work was being completed there appeared a report by Huck and Peyton of Johns Hopkins⁶ stating that an exhaustive series of tests had been made on 25 operative cases before and after ether anesthesia, and had in no instance shown the serious changes described by Levine and Segall. At the end of our series we find ourselves confirming the Johns Hopkins investigators.

CONCLUSIONS

1. Prolonged ether anesthesia was not found to cause any change in the isoagglutinative phenomena of the human blood.
2. We find no evidence for believing that when patients are transfused within the twenty-four hour period following a profound ether anesthesia from donors previously matched and found suitable, any severe reaction that may chance to occur can be traced to changes in the isoagglutinative phenomena of the recipient's blood.

POSTTRANSFUSION REACTIONS: A REVIEW OF 190 TRANSFUSIONS PERFORMED AT THE WOMAN'S HOSPITAL, NEW YORK CITY

By M. C. SOUTER, A.B., M.D., AND GARRETT D. DURYEA, A.B., M.D.

We have reviewed 190 transfusions performed on 167 patients from July 1, 1922, to April 1, 1924. This is the total number of transfusions done at the Woman's Hospital during that period, with the exception of 12 transfusions given to obstetrical patients, which were not considered in this series. Of the 167 cases 161 were operated upon.

BLOOD GROUPING

The Moss classification is used as the standard and the grouping of all patients is done by laboratory technicians who use the Moss hanging drop method. The test is easily performed; the apparatus is quickly set up; and the presence or absence of agglutination is observed under the microscope. Half an hour is allowed to elapse after the preparation of the drop before concluding that there is no agglutination. Furthermore, in all the cases except three, the donor's

and recipient's blood were matched directly. A hanging drop preparation is made with the recipient's serum and the donor's cells in a 1:20 dilution with 3 per cent sodium citrate solution. This is examined after half an hour for evidences of agglutination. In the three emergency cases which were not directly matched severe reactions followed. It was found that the reactions had been due to misgrouping. This shows that unless a reliable laboratory is at hand to carry out accurate grouping the direct testing of donor's and recipient's blood is the only way to be sure of their compatibility.

TRANSFUSION TECHNIC

The method of transfusion used in all cases is the syringe cannula method of Unger for the transfusing of whole unmodified blood.

* * * *

The frequency in appearance of the various manifestations of reaction was represented as in Table I.

TABLE I

MANIFESTATIONS OF REACTION	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS
Chill	40	81.6
Temperature rise of at least 2.5 degrees	27	55.1
Edema	3	6.1
Nausea or vomiting	5	10.2
Urticaria	5	10.2
Headache	4	8.1
Respiratory distress	2	4.0
Pain in joints	2	4.0
Diarrhea	1	2.0
Unconsciousness	1	2.0

The time elapsing before the appearance of symptoms varies widely as shown in Table II which represents 43 cases in which the time was recorded.

TABLE II

TIME	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS
Immediately	8	18.6
Less than 4 hours	23	53.4
4 to 12 hours	2	4.6
12 to 24 hours	2	4.6
24 to 36 hours	8	18.6

Table II indicates that the majority of reactions occurred in less than 4 hours from the time of transfusion.

Chills were present in 40 cases. There was a great variation in degree of severity, from a chilly sensation lasting a very few minutes to a severe chill lasting one hour. Tables III and IV indicate the type and the duration of chills.

TABLE III

TYPE OF CHILL	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS
Chilly sensation	3	7.5
Moderate	32	80.0
Severe	5	12.5

TABLE IV

DURATION OF CHILL	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS
1 to 5 minutes	8	21.6
5 to 15 minutes	12	32.4
15 to 30 minutes	7	18.9
30 to 60 minutes	10	27.0
Not recorded	3	

It is evident that the greater number of chills were moderate and lasted from 5 to 15 minutes.

In 27 of the cases there was a rise of temperature of at least 2.5 degrees, the average rise being 3.7 degrees. The duration of the temperature varied widely, the greatest number lasting for less than four hours as shown in Table V.

TABLE V

DURATION OF TEMPERATURE	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS
Less than 4 hours	9	33.3
4 hours to 8 hours	7	25.9
8 hours to 12 hours	2	7.4
12 hours to 24 hours	6	22.2
24 hours to 36 hours	1	3.7
36 hours to 72 hours	2	7.4

As has been stated, of the 190 cases transfused 49 cases or 25.7 per cent had reactions. Therefore, these figures are used as the basis for determining the factors which may cause reactions. The factors to be considered are:

I. *Blood Relationship*.—The relative frequency of reactions in cases where donor and recipient were or were not blood relatives is shown in Table VI.

TABLE VI

BLOOD RELATIONSHIP	NUMBER OF TRANSFUSIONS	NUMBER OF REACTIONS	PERCENTAGE OF REACTIONS
Yes	68	15	22.0
No	102	32	31.3
Not recorded	20	2	....

II. *Blood Groups*.—Table VII shows a comparison between the percentage of reactions when a universal or group IV donor was used and when the recipient and donor were in the same group.

TABLE VII

GROUPING	NUMBER OF TRANSFUSIONS	NUMBER OF REACTIONS	PERCENTAGE OF REACTIONS
Not recorded	8	..	....
Donor and recipient of same group	147	41	27.8
Universal donor	35	5	14.3
(Donor Recipient)			
(IV I)	1	0	0.0
(IV II)	22	4	18.1
(IV III)	12	1	8.3

It is evident that using a universal donor does not increase the number of reactions.

The relative number of reactions in the different blood groups of 190 cases transfused are shown in Table VIII.

TABLE VIII

BLOOD GROUP	NUMBER OF TRANSFUSIONS	NUMBER OF REACTIONS	PERCENTAGE OF REACTIONS
I	3	1	33.3
II	52	15	28.8
III	22	4	18.1
IV	105	29	27.6
Not recorded	8	..	....

There is practically no difference in the percentage of reactions in each group. If a factor of incompatibility does influence reactions it is one which is not detected by ordinary laboratory methods of grouping individuals.

III. *Operator*.—Does the causative factor of reactions lie in the skill and ability of the one who performs the transfusion? Table IX shows that there is a wide variation in the percentage of reactions in transfusions performed by different operators.

TABLE IX

OPERATOR	NUMBER OF TRANSFUSIONS	NUMBER OF REACTIONS	PERCENTAGE OF REACTIONS
A	28	4	14.2
B	28	7	25.0
C	17	1	5.8
D	14	4	28.0
E	13	4	30.0
F	1	1	100.0
G	7	2	28.5
H	9	5	55.5
I	21	5	23.8
J	24	4	16.6
K	5	3	60.0
L	11	1	9.0*
M	12	8	66.0

If one accepts the theory of Drinker and Brittingham, that reactions are due to the formation of abnormal proteins as the result of

destruction of the blood platelets during the operation, the skill and deftness of the operator surely would be a factor of considerable importance. It is shown in Table IX that some operators do have a higher percentage of reactions. It would be difficult to estimate the importance of this factor as a cause.

IV. *Time*.—The transfusions were either preoperative, performed during the operation, or postoperative.

Table X shows that the highest percentage of reactions occur in cases which were transfused before operations. This is probably due to the fact that the patient is at that time better able to respond to the introduction of a foreign substance.

TABLE X

TIME	NUMBER OF TRANSFUSIONS	NUMBER OF REACTIONS	PERCENTAGE OF REACTIONS
Preoperative	91	34	37.3
During operation	13	0	0.0
Postoperative	53	15	28.3
Not recorded	33		

V. *Amount of Blood Given*.—The relative frequency of reactions following the transfusion of varying amounts of blood is shown in Table XI.

TABLE XI

AMOUNT	NUMBER OF TRANSFUSIONS	NUMBER OF REACTIONS	PERCENTAGE OF REACTIONS
Less than 300	10	3	30.0
300 to 500	30	7	23.3
500 to 700	135	35	25.9
700 to 900	8	1	12.5
Not recorded	7		

From Table XI it would appear that up to a certain point the larger the amount of blood transfused at one time the greater the number of reactions. It is a question whether small amounts of blood (less than 500 c.c.) given frequently would be followed by fewer reactions than are large amounts given at one time. The comparative ease of the technic makes the former possible now whereas it was not possible a few years ago. This problem falls into the scope of the discussion of the next factor.

TABLE XII

TRANSFUSIONS	NUMBER OF TRANSFUSIONS	NUMBER OF REACTIONS	PERCENTAGE OF REACTIONS
First	147	42	28.5
Second	17	6	35.2
Third	3	2	66.6
Not recorded	23	..	....

VI. *Repeated Transfusions.*—Table XII shows the increase in the number of reactions in subsequent transfusions. It may be noted here that no patient had more than one reaction.

* * * *

What effects do posttransfusion reactions have upon the general condition of the patient as indicated by her pulse and blood pressure, and upon the benefits which the patient should derive from the transfusion? Change in pulse rate is the first thing to be considered. Tables XIII and XIV are a comparison between the rise and fall of the pulse rate in the patients who had had no reactions and those who had had reactions. The time period for the rise or fall was forty-eight hours.

TABLE XIII
PATIENTS WITH NO REACTIONS

PULSE	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS	AVERAGE VARIATION IN POINTS
Rise	33	32.0	12.1
Fall	57	55.3	13.9
No change	13	12.6	....
Not recorded	87	....	....

TABLE XIV
PATIENTS WITH REACTIONS

PULSE	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS	AVERAGE VARIATION IN POINTS
Rise	24	55.8	13.5
Fall	15	34.8	12.8
No change	4	9.3	....
Not recorded	6	....	....

From Tables XIII and XIV it is evident that after transfusion the pulse rate had a tendency to fall except in cases where reactions caused a rise. The average actual rise or fall in pulse rate was practically the same both in cases with and without reactions.

There was a somewhat constant variation in blood pressure in those cases which had reactions and those which did not. In the greater percentage of cases with reactions the blood pressure was raised. In the majority of cases without reactions the blood pressure fell. This is shown in Tables XV and XVI. When the systolic pressure was raised and the diastolic fell or vice versa, that case was classified as irregular. In other cases both the systolic and diastolic pressure either fell or rose together.

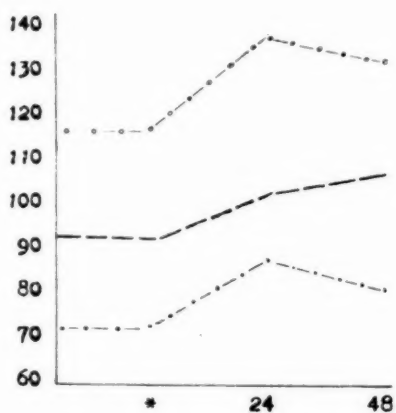
As indicated in Tables XV and XVI reactions have a tendency to raise the blood pressure. In patients who have a very high blood pressure before transfusion this fact gains importance and may cause serious results.

TABLE XV
PATIENTS WITH NO REACTIONS

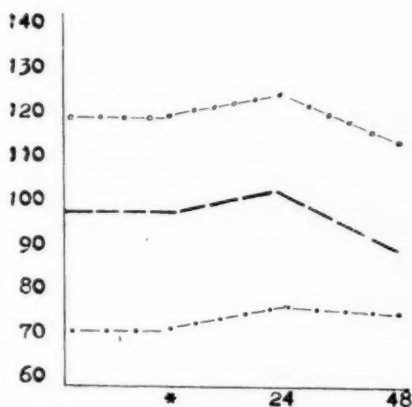
BLOOD PRESSURE	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS
Rise	28	32.2
Fall	33	37.9
Irregular	22	25.2
Not changed	4	4.5
Not recorded	54	....

TABLE XVI
PATIENTS WITH REACTIONS

BLOOD PRESSURE	NUMBER OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS
Rise	13	30.9
Fall	12	26.1
Irregular	14	33.3
Not changed	3	7.1
Not recorded	7	....



REACTIONS



NO REACTIONS

Key to Graphs

Abscissa = hours

Ordinate = points of rise or fall

* = time of transfusion

Systolic pressure = - - - - -

Diastolic pressure =

Pulse rate = — — — — —

Graphs 1 and 2.

In order to illustrate the average rise and fall in points of the pulse and the systolic and diastolic pressure Graphs 1 and 2 have been made. The first represents such curves for those patients with reactions—the second for those without reactions.

It is interesting to note the results of investigation in order to discover what influence reactions have on the desired benefits of transfusion—that is, upon the hemoglobin determination and red blood cell count. The data available cover observations of these two

points only during a period of forty-eight hours. The ultimate benefits to the patient after this short period were not recorded.

Table XVII shows the percentage of cases with and without reactions which had either an increase or a decrease in hemoglobin. It also shows the average percentage of increase or decrease.

TABLE XVII

HEMOGLOBIN	NO. OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS	NO. OF CASES WITH REACTIONS	PERCENTAGE OF CASES WITH REACTIONS	NO. OF CASES WITHOUT REACTIONS	PERCENTAGE OF CASES WITHOUT REACTIONS
Rise	138	87.3	42	91.3	96	85.7
Fall	20	12.6	4	8.6	16	14.2
Not recorded	32	....	3	....	29	....

In the total number of transfusions there was an average rise of 29.8 per cent in the hemoglobin and an average fall of 16 per cent. In the cases with reactions the average rise of hemoglobin was 35.6 per cent, the average fall 13.7 per cent, while in those cases without reactions the average rise and fall were 27.2 per cent and 16.6 per cent respectively.

TABLE XVIII

RED BLOOD CELL	NO. OF TRANSFUSIONS	PERCENTAGE OF TRANSFUSIONS	NO. OF CASES WITH REACTIONS	PERCENTAGE OF CASES WITH REACTIONS	NO. OF CASES WITHOUT REACTIONS	PERCENTAGE OF CASES WITHOUT REACTIONS
Rise	134	84.2	42	93.3	92	80.7
Fall	25	15.7	3	6.6	22	19.2
Not recorded	31	....	4	....	27	....

Table XVIII shows a comparison in the rise and fall of the red blood cell count in cases with and without reactions. In the total number of transfusions there was an average rise of 26.1 per cent in the red blood cell count and an average fall of 12.8 per cent. In the cases with reactions the average rise in the red blood cell count was 30.5 per cent, the average fall 13.5 per cent, while in those cases without reactions the average rise and fall were 24.1 per cent and 12.7 per cent respectively.

Tables XVII and XVIII show unexpected and interesting results. The fall in hemoglobin and red blood cells is chiefly found in cases which were transfused either during operation or following operation. It is evident from the tables that there is a higher percentage of cases with an increase in both hemoglobin and red blood cells among those patients who had reactions than among those patients who did not have reactions. Also the average percentage increase in both hemo-

globin and red blood cells is greater in patients with reactions. In reviewing the literature on this subject no report has been found showing the actual effect of reactions on the red blood cell count and hemoglobin determinations. Therefore, it cannot be stated whether these findings are unusual or not. One might naturally expect to find that reactions delayed the rise in hemoglobin and red blood cells and lessened the benefits of transfusion. From this investigation it would seem that reactions had the opposite effect. The process which brought about these results may be similar to that occurring when foreign protein injections are given. The injection of proteins, such as milk in cases of chronic infection, stirs up the natural body defenses and increases the individual's resistance. In the same way the blood forming organs may receive stimulation from posttransfusion reactions as well as from the transfused blood itself.

THE TREATMENT OF INCOMPLETE ABORTION

AN ANALYSIS OF THE MANAGEMENT OF 311 CASES OF INCOMPLETE
ABORTION TREATED AT THE WOMAN'S HOSPITAL, NEW YORK CITY
FROM SEPTEMBER, 1919 TO JANUARY, 1924

BY JOSEPH HERZSTEIN, M.S., M.D., AND IRENE DAVIS, A.B., M.D.

THE series of cases studied is composed of over 300 unselected cases treated at the Woman's Hospital during the period of September, 1919, to January, 1924. The essential purpose of the study was to determine the results of different methods of managing cases of incomplete abortion. The recent literature on the treatment of abortion contains numerous discussions of the "active" versus the "conservative" handling of such cases. The general trend of opinion is definitely in favor of conservative treatment, for septic cases especially.

Among 200 cases of septic abortion, all had a temperature of 100° or more on admission. Of these, 100 had artificial emptying of the uterus, during the febrile period and as soon as convenient. In a parallel group of 100 cases, no local treatment was applied. His results definitely favored the conservative method of treatment as indicated by Table I.

The present study was limited to cases of incomplete abortion, as based on the final diagnosis appearing on the hospital records. Cases with questionable retained secundines were ruled out, as well as those of inevitable or complete abortion.

During the period extending from September, 1919, to January, 1924, there were 311 such cases. These were admitted to the ward services of various attending surgeons and many were private cases. The choice of

method of treatment rested with the surgeon, there being no set procedure for the handling of these cases which all had to follow.

METHOD OF MANAGEMENT OF 311 CASES OF INCOMPLETE ABORTION ADMITTED FROM
SEPTEMBER, 1919, TO JANUARY, 1924

METHOD	NUMBER OF CASES	PER CENT OF TOTAL
Dilatation and curettage	212	68.2
Curettage without dilatation	8	2.5
Dilatation and curettage and other simultaneous operation*	33	10.6
Other operations	3	1.0
No operative treatment	49	15.4
Refused operation	4	1.3
Septic cases, untreated	2	0.6
Operatively treated	256	82.3
Nonoperatively treated	55	17.7
Total Cases	311	100.0

*Among these were insertion of radium pack, retroversion corrections, laparotomies, amputations of cervix, repair of pelvic floor and other gynecologic operations.

SUMMARY AND CONCLUSIONS

A statistical analysis of 311 case records of incomplete abortion treated at the Woman's Hospital during the course of approximately five years has been presented.

Both active and conservative methods of treatment have been employed.

The proportion of patients treated operatively was 81.3 per cent. The rest were not operated.

The abortions occurred in 87.1 per cent of the patients before the fourth month of gestation.

The time elapsing between the event of abortion and hospital admission varied from a few hours to several months; 30.6 per cent of the operated patients aborted one week or less before admission, while 69.4 per cent aborted one week or more before they sought relief. One-third of the patients had symptoms for a month or more before seeking hospital attention. The patients treated conservatively came to the hospital somewhat earlier.

Of the patients treated operatively, 87.5 per cent had a temperature on admission of less than 100°. Of the conservatively handled patients, 75 per cent had no temperature on admission.

The average duration of temperature before curettage was 0.26 days. The average duration of postoperative temperature was 0.9 days. The average days of temperature of the nonoperated cases was 1.8 days.

Of the curetted cases, 46.1 per cent ran no temperature at all; 45.2 per cent had a temperature on one or two days. Among the conservative cases, 58.3 per cent at no time had a temperature over 100°.

The average hospital stay for the simple curetted cases was 11.6 days, and for the conservative cases 11.8 days.

Among the cases with a simple dilatation and curettage, those that were operated soonest after admission had the shortest course of post-operative temperature and hospital stay. In afebrile cases, therefore, especially in those who have had symptoms for some time, a deferred curettage has no special merit over an early one, other than that it gives more time to study the nature of the case.

PYELITIS AS A POSTOPERATIVE COMPLICATION

By WILLIAM M. MALONEY, A.B., M.D., AND
FREDERICK H. CRACCO, A.B., M.D.

THIS paper is based on a study of those cases in which pyelitis developed as a postoperative complication following gynecologic operations in the Woman's Hospital, New York, during the period of five years ending December 31, 1923. The data given were obtained from a study of the histories of these patients and not from bedside observations.

* * * *

In going through the histories all cases showing evidence of chronic pyelitis were excluded and only those cases in which pyelitis developed as a postoperative complication following gynecologic operations were accepted. In the five year period ending December 31, 1923, there were found twenty-four such cases and Table I shows how these cases were distributed over the five years and the percentage of the total gynecologic operations performed in this period.

TABLE I

YEAR	OPERATIONS	COMPLICATION OF PYELITIS	PER CENT
1919	1483	2	0.13
1920	1339	4	0.29
1921	1598	4	0.25
1922	1577	8	0.51
1923	1312	6	0.46
Total	7300	24	0.33

This study was undertaken for the purpose of determining, if possible, why this complication of pyelitis occurred, and in going through the histories of these twenty-four cases I have endeavored to consider all factors which might have any bearing on the problem.

The important points shown in Table II* are (a) that twenty-one of the twenty-four patients were married and of these nineteen had had one or more pregnancies. (b) Instrumental deliveries and previous

*Omitted for lack of space.

operations, especially those on the pelvic organs, and in this connection we must consider the possibility of a residual low grade infection being left behind which was stirred up by the recent operation just previous to the onset of their attack of pyelitis.

Table III* gives the type of operation which these patients had just previous to their attack of pyelitis, also the surgical pathology found and the condition of the wound. The type of operation is similar in each case but some of those operative procedures were more extensive than others, and the surgical pathology is given as far as it was available in the histories. Infected wounds are a likely source of infection in pyelitis, as the infecting organisms can be carried by way of the blood stream to the kidneys; however, in this series infected wounds were not very numerous and the few that did occur soon cleared up.

Since pyelitis followed all of these operative procedures the question naturally arises as to just what part, if any, these operations played in the etiology of this complication. The trauma and shock of the operation would certainly lower the resistance of the patient against infection to a very considerable extent and foci of infection (if present), which would be held in control under normal conditions, would now have an opportunity of starting lesions in other regions of the body and especially in the kidney. Also in cases of salpingitis a low grade of infection usually persists in this region after the acute process subsides. Operations for the relief of this condition are likely to stir up this infection, which gets to the kidney by way of the blood stream, and may cause pyelitis. The same would apply after operations for appendicitis. It is also to be noted that the pelvic floor was repaired in twelve or half of these cases. The field of this operation is far from being sterile and it is possible that infection may have been introduced in at least some of these operations, which later reached the kidney and caused the pyelitis, but I cannot supply any definite proof that this actually occurred. Just how much importance we are justified in assigning to this possibility must, for the present at least, remain a matter of speculation.

From a study of Table IV* it will be seen that in two cases the attack occurred the same day as the operation. In the rest of the cases the earliest onset was three days after and the latest was twenty-one days after the operation. The average period elapsing between operation and onset was 7.3 days. Eighteen of these patients gave a history of constipation before operation and the colon bacillus was present in twenty-one out of the twenty-four cases. This prevalence of the colon bacillus can be accounted for by the fact that the cecum and ascending colon have lymphatic connections with the right kidney which are not found on the left side and, also, this organism can

*Omitted for lack of space.

reach either kidney by way of the blood stream. From these facts it is pretty clear that in constipation we have one of the chief causes of pyelitis.

In the five year period ending December 31, 1923, there were 7300 gynecologic operations and of these only 24 cases developed pyelitis following operation, yet every case had about the same amount of catharsis. It would therefore appear that this theory regarding catharsis does not hold, and until some definite proof is at hand I don't think we can consider catharsis as an active cause of pyelitis.

Cystitis was recorded in only two cases and was most likely the result of the existing pyelitis rather than its cause.

Catheterization is sometimes considered as a possible cause of pyelitis. Table IV* shows that these patients were usually catheterized once before operation and as often as necessary after operation until they voided spontaneously. Since it was done under sterile precautions I think we can safely eliminate it as a cause of pyelitis, and since it prevented retention during a period when the urine contained bacteria it seems reasonable to consider it as a prophylactic measure against pyelitis rather than a possible cause.

From a study of Table V it will be noted that with one exception each case had just one attack of pyelitis. The duration of these attacks varied from two days up to twenty-nine days, the average duration being twelve days. *B. coli* was the organism most often found. It occurred alone in eighteen cases, with *Staphylococcus albus* twice and with *streptococcus* once.

Regarding treatment these patients were kept in bed, given a light diet and quantities of fluids. The only medicinal treatment given was acid sodium phosphate and urotropin. Two cases had bladder irrigations and the last two cases had high colonic irrigations in addition to the above-mentioned drugs. Two cases did not get any drug treatment and, although the infecting organism was not *B. coli*, these cases cleared up spontaneously in seven and two days respectively, which was well within the average duration of these attacks. This occurrence would cast some doubt on the efficiency of acid sodium phosphate and urotropin in the treatment of pyelitis.

The chief etiologic factors of pyelitis following operations as shown by studies of the histories of these cases are: (1) Constipation; (2) operations for relief of chronic conditions such as appendicitis and salpingitis; (3) operations on the pelvic organs such as hysterectomy, ovariectomy, etc.; (4) operations around the rectum such as perineorrhaphy, and (5) lowering of the patient's resistance (general and specific) to infection. Kretschmer⁴ in reviewing 200 cases of pyelitis states that 30 per cent of these patients gave a history of constipation of varying degree for which laxatives and purgatives were freely used. In a small number of cases the patients suffered from

*Omitted for lack of space.

lesions of the rectum such as hemorrhoids and from lesions of the anus such as fissures and fistulae. Sixty-one per cent of the cases occurred in females and 39 per cent in males.

CONCLUSIONS

1. The chief etiologic factors of pyelitis following gynecologic operations are:

- (a) Lowering of patients' resistance (general and specific) to infection due to trauma and shock of operation.
- (b) Constipation.
- (c) Operations for relief of chronic disease.
- (d) Operations on the pelvic organs and around the rectum.
- (e) Focal infections.
- (f) Ascending infections by way of the lymphatics or by ureteral reflux.

2. The question of focal infection should receive careful attention on physical examination.

3. That such drugs as alkalies, urotropin, etc., usually used in the treatment of pyelitis are inefficient.

4. That pelvic lavage is the most efficient treatment for pyelitis.

News Items

New York, N. Y. Dr. B. P. Watson of Edinburgh, Scotland, has been appointed Chief of the Sloane Hospital for Women.

St. Louis, Mo. Dr. Otto H. Schwarz has been appointed Professor of Obstetrics in the Medical School of the Washington University.